OCTOBER 3, 1931

Railway Age

Founded In 1856

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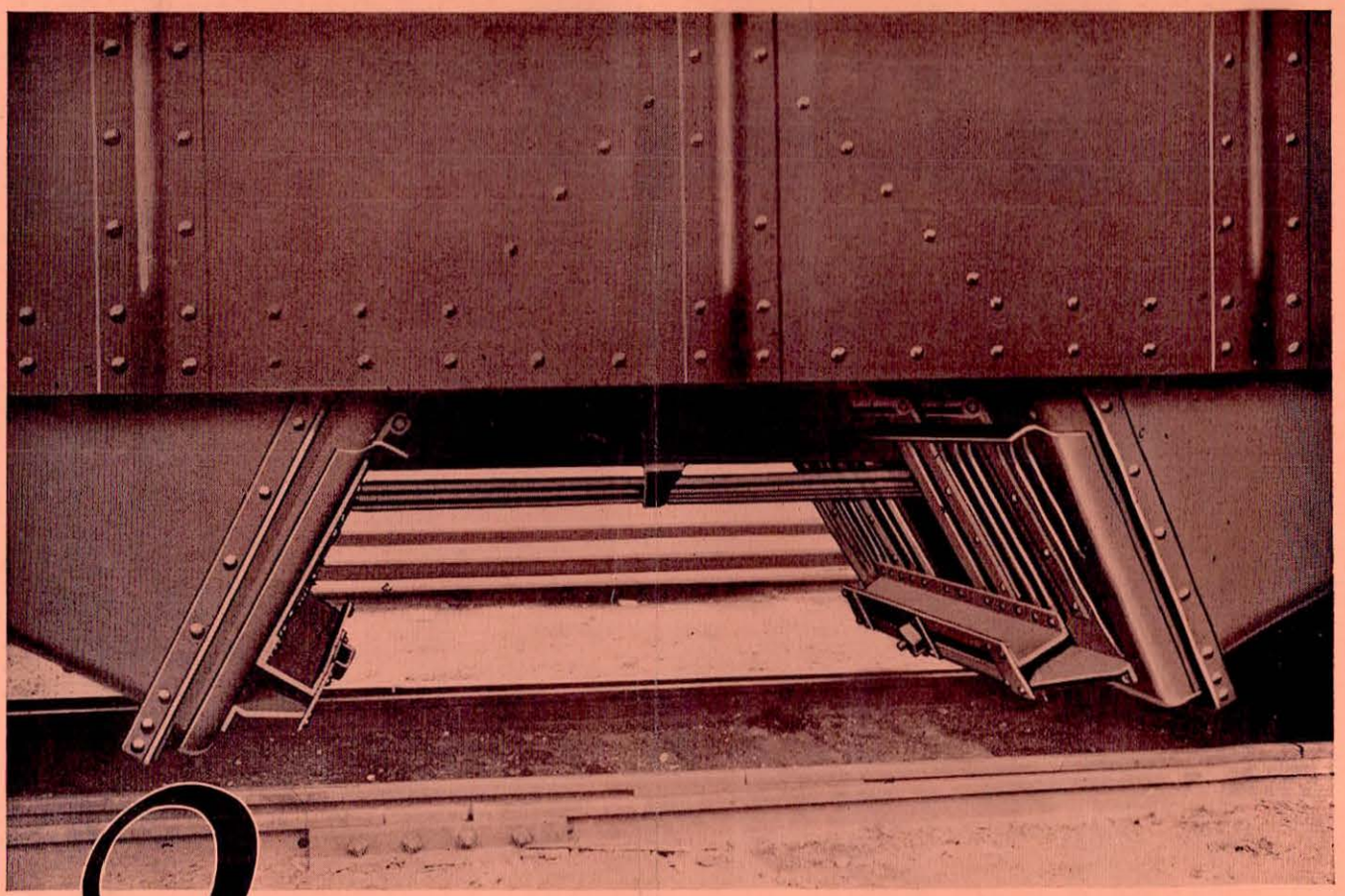
In This Issue

Article No. 13
OPERATING ECONOMY SERIES

Cutting Costs on the Repair Track

NEXT WEEK
Article No. 14
"Fighting Snow—
Killing Weeds"



Utilization

Corrugating a flat plate increases both its strength and resilience. This condition is ideally utilized in Ajax Corrugated Doors which combine these features to withstand present day loading practices.

AJAX CORRUGATED DROP DOORS

UNION METAL PRODUCTS CO.

NEW YORK CHICAGO ST. LOUIS WASHINGTON
RICHMOND HOUSTON SAN FRANCISCO
KANSAS CITY MONTREAL

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Address communications to 30 Church St., New York City.

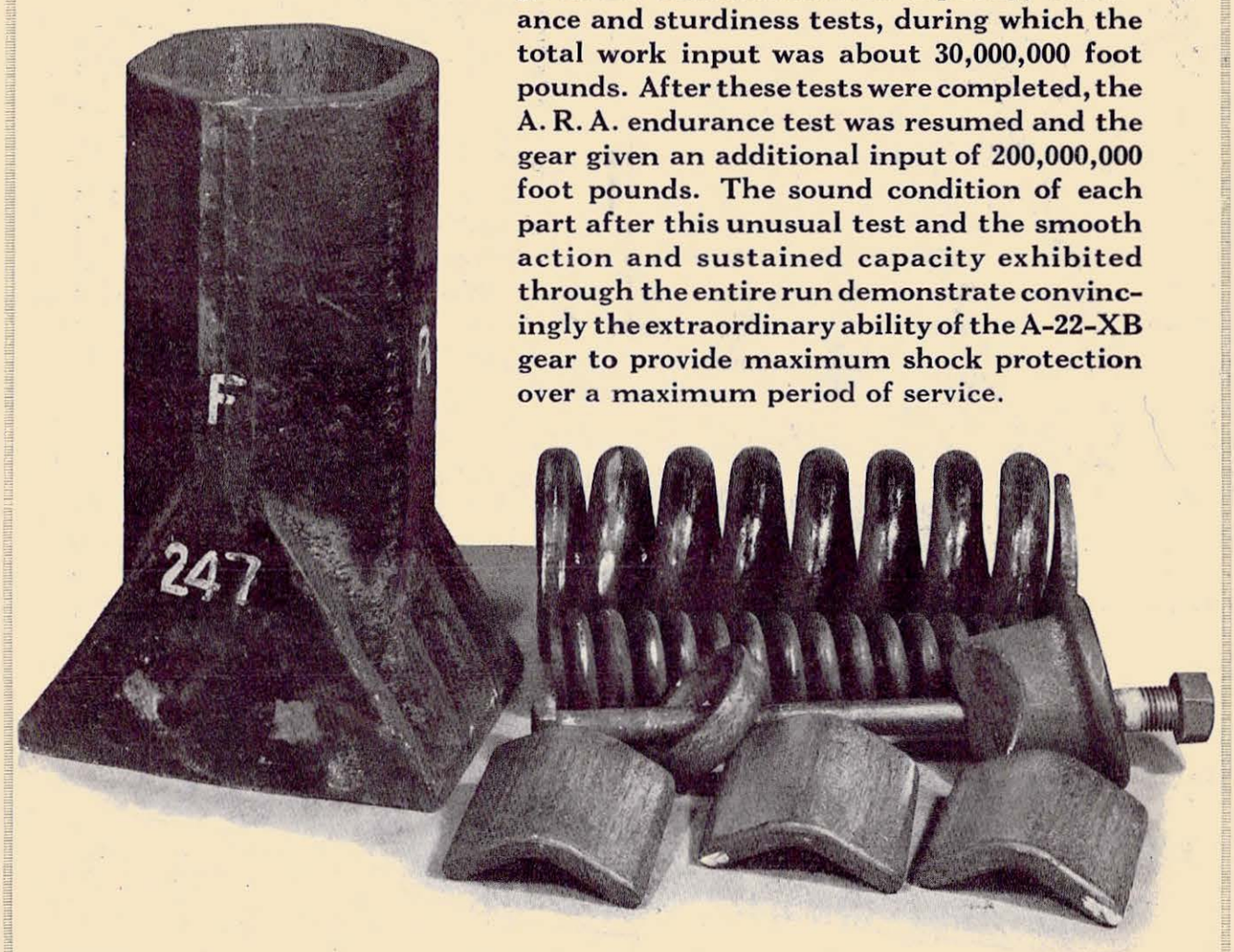
MINER

Class A-22-XB Friction Draft Gear

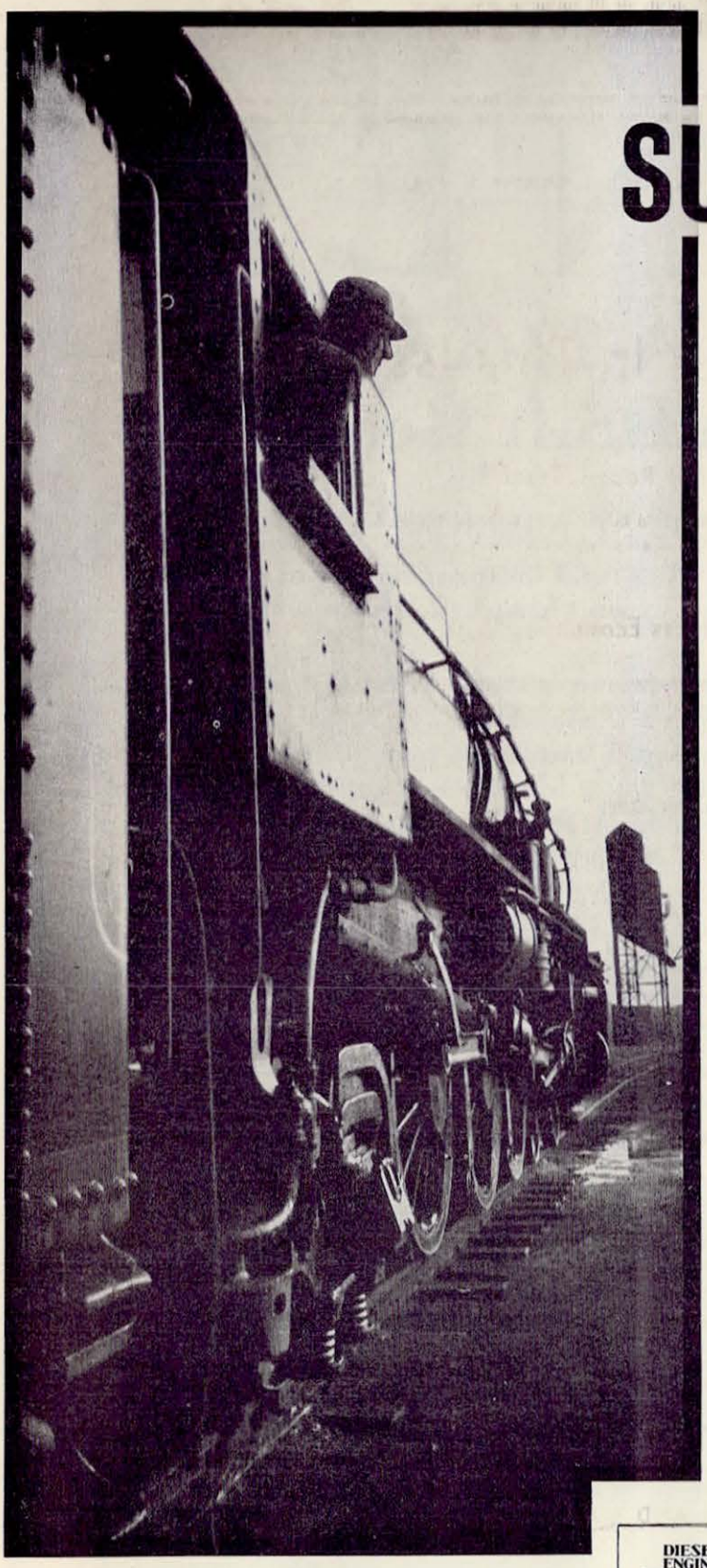
TWO HUNDRED AND THIRTY MILLION FOOT POUNDS

of impact work under the 27,000-pound hammer had been absorbed by the gear illustrated below when this photograph was taken.

This device, a stock A-22-XB gear, was first given the standard A. R. A. capacity, endurance and sturdiness tests, during which the total work input was about 30,000,000 foot pounds. After these tests were completed, the A. R. A. endurance test was resumed and the gear given an additional input of 200,000,000 foot pounds. The sound condition of each part after this unusual test and the smooth action and sustained capacity exhibited through the entire run demonstrate convincingly the extraordinary ability of the A-22-XB gear to provide maximum shock protection over a maximum period of service.



W. H. MINER, INC., CHICAGO



SUPPOSE HE DARED TO GUESS!

Why guess about lubrication? Wrong lubrication is a hazard your road can't afford when it's so easy to get the right kind of lubrication for every piece of equipment used.

The Vacuum Oil Company, Inc. provides the exactly right Gargoyle Lubricant for all types of locomotives, rail motor cars, power houses, floating equipment, buses, airplanes, shop equipment, etc.

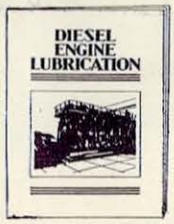
The economy of using Gargoyle Lubricants as specified by Vacuum Oil Company lubrication engineers has been proved by many industries throughout the entire world. Railroads too, have found that there is no guesswork when high grade Gargoyle Lubricants are used.

The builders of many kinds of equipment your road uses support the lubrication recommendations made by Vacuum Oil Company engineers.

One of our representatives will be glad to offer you some interesting proofs of the economy of using Gargoyle Lubricants. There is no obligation. Address: Railroad Department, Main Office, 61 Broadway, New York.

GARGOYLE

Railroad Lubricants



Stationary Steam Engines, Diesel Engine Lubrication, Air Compressor Lubrication, Bearings and Their Lubrication, Gear Lubrication, Machine Shop Lubrication.

These specialized treatises will help you secure better lubrication. We will be glad to send any of them to any railroad executive or lubrication engineer, if requested on your road's letterhead.

VACUUM OIL COMPANY, INC.

Published every Saturday by the Simmons-Boardman Publishing Company, 34 North Crystal Street, East Stroudsburg, Pa., with executive offices at 30 Church Street, New York

All communications should be addressed to the New York Office 30 Church Street

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Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name Registered U. S. Patent Office

Vol. 91 October 3, 1931 No. 14

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The thirteenth article in the series on operating economies, telling how modern equipment will speed up "rip track" work and increase output capacity.

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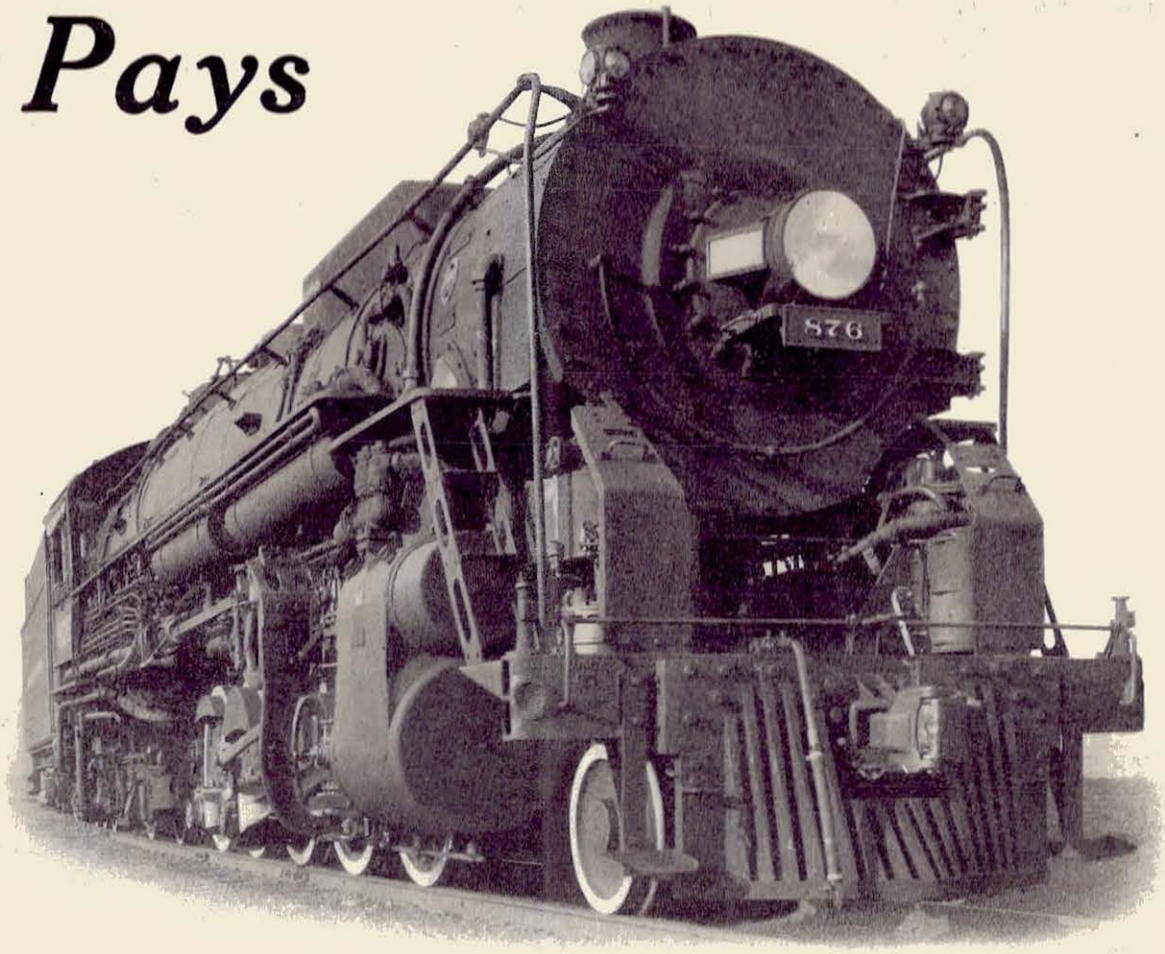
It Pays



STRICTLY Modern Locomotives, replacing those built before the establishment of present train schedules, create big additions to net operating income by lowering the cost per ton-mile of freight carried.

Thousands of locomotives now in use are no longer capable of economically handling the traffic assigned to them.

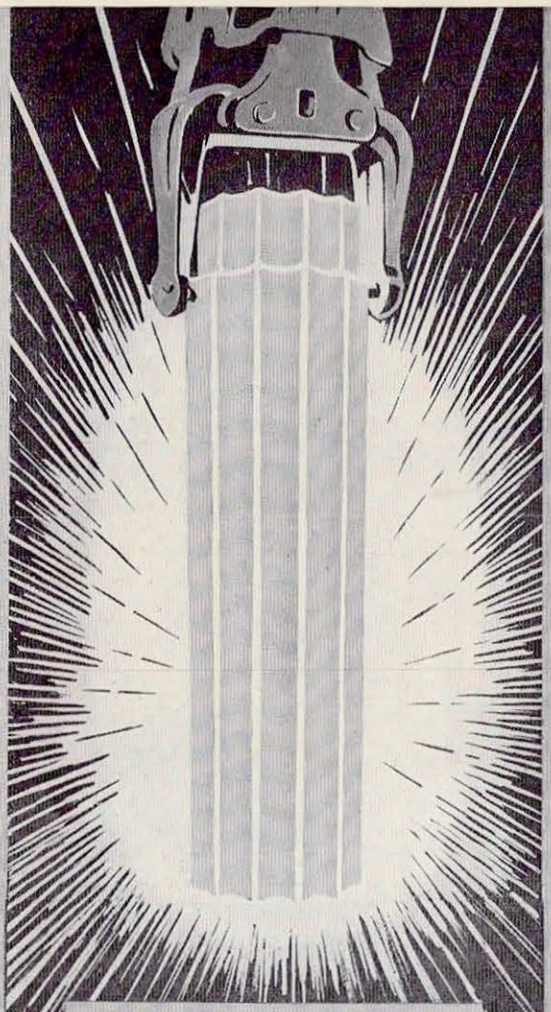
Careful studies of concrete situations show that replacement of such power with modern locomotives of adequate boiler horsepower will show immediate savings —paying for themselves in from six to ten years.

It takes Modern Locomotives to make money these days!

THE BALDWIN LOCOMOTIVE WORKS ★ 1831 1931

THE
BALDWIN
LOCOMOTIVE WORKS
PHILADELPHIA

FOR THE MOST EXACTING USES



Typical Uses:

¶ **AUTOMOTIVE and AERONAUTIC**—For radiator shells, hub caps, lamps, bumpers, moldings, polished parts and fittings, hardware and trim, airplane parts and instruments.

¶ **MANUFACTURING and INDUSTRIAL**—Machinery and furnace parts, dampers, fans, preheaters, pumps, conveyors, turbine blades, nozzles, plungers, and machinery specialties.

¶ **CHEMICAL**—Vats, tanks, stills, digesters, condensers, retorts, paper and pulp manufacturing equipment, circulation systems, and laboratory apparatus.

¶ **OIL REFINING**—Bubble caps, still tubes, linings, heat exchangers, ducts, containers, tanks, agitators, and other refining equipment.

¶ **FOOD HANDLING**—Pasteurizers, tables, hospital and hotel kitchen equipment, restaurant fixtures, cafeteria trays, food preserving and dairy machinery and accessories, ice cream and milk containers and utensils.

¶ **ARCHITECTURAL**—Structural members and supports, hinges and hardware, decorative metal embellishments, flat surface facings, moldings, doors, grilles, panels, and ornamental work.

¶ **HOME APPLIANCES**—Kitchen equipment, cooking and canning utensils, furniture, cabinets, electrical appliances, sinks, plumbing fittings, stoves, ranges, and tableware.

¶ **MISCELLANEOUS**—Packing house equipment, soda fountain counters and fixtures, display cases, humidors, handles, hooks, trays, golf clubs, skates, switch boards, metallic mirrors, laundry machinery, tank cars, railway car parts and fittings, and many other uses where beauty and resistance to corrosion are important factors.

Chromium-Alloy Steels
Ferritic

USS 12
USS 17
USS 27

USS

Chromium-Nickel Steels
Austenitic

USS 18-8
USS 18-12
USS 25-12

STAINLESS AND HEAT RESISTING ALLOY STEELS

FOR all applications in which appearance and beauty, effective resistance to corrosion, and unusual physical properties are important considerations, the alloy steels of the U S S series are furnishing an answer to the question, *what metal is adaptable?*

In your living room and kitchen, favorite hotel and restaurant, bank vault and office building, on your automobile, and even in your pockets, you may encounter articles with essential parts made of U S S Stainless Steels.

Industries ministering to your needs use this remarkable alloy steel in their products and processes. Artistic as well as utilitarian, the U S S Stainless Steels find manifold applications. Write for full information to the subsidiary companies of the United States Steel Corporation listed below.

U S S Chromium-Nickel Alloy Steels are produced under licenses of the Chemical Foundation, Inc., New York; and Fried. Krupp A. G. of Germany.

U·S STEEL

American Sheet and Tin Plate Company, Pittsburgh
Sheets and Light Plates

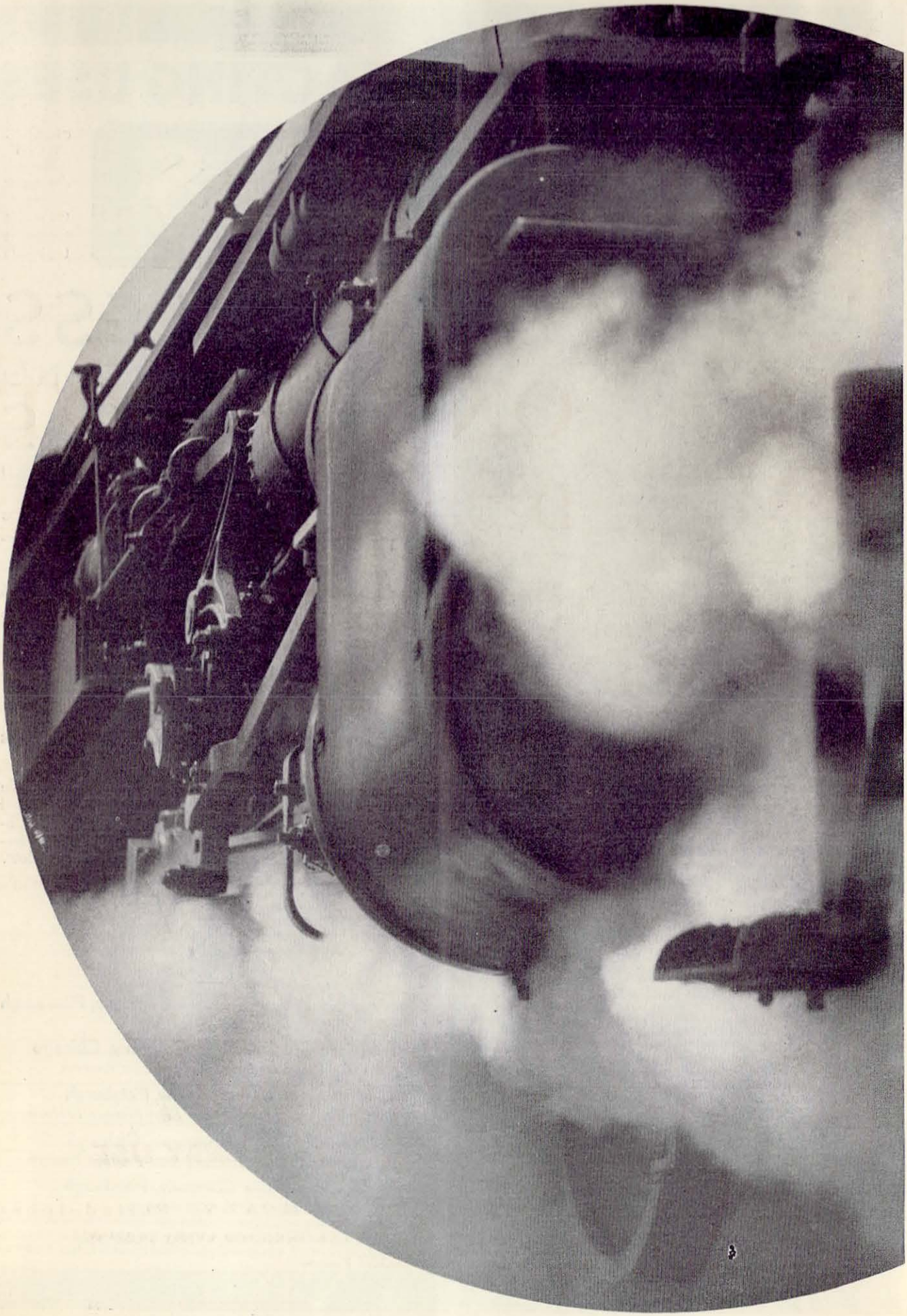
American Steel & Wire Company, Chicago
Cold Rolled Strip Steel, Wire and Wire Products

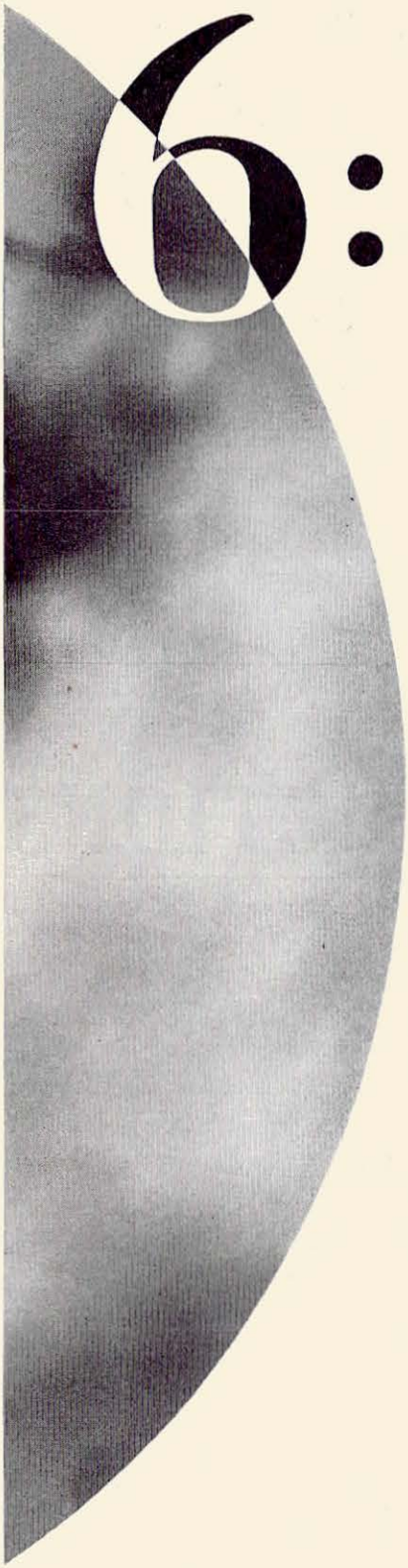
Carnegie Steel Company, Pittsburgh
Bars, Plates, Shapes, Special and Semi-Finished Products

Illinois Steel Company, Chicago
Bars, Plates, Shapes, Special and Semi-Finished Products

National Tube Company, Pittsburgh
Pipe and Tubular Products

Pacific Coast Distributors: COLUMBIA STEEL COMPANY, San Francisco
Export Distributors: U. S. STEEL PRODUCTS COMPANY, New York City





6:04 ON THE DOT

DING-DONG, ding-dong. The Limited grinds, hissing, to a stop. Conductor and engineer meet beside the panting monster to compare watches. Both dials read 6:04, right on the dot.

Passengers hustle out of the train shed. Few realize the work, the responsibility of bringing a train in on time. Yet they are quick to complain if it's late. Passengers take traveling comfort and prompt service for granted. A railroad can take nothing for granted. It must be certain of the absolutely dependable performance of every piece of equipment. A vital part of railroad equipment is the storage battery. And because of the importance of having thoroughly reliable performance and operating economy at all times the majority of roads trust in Exide Batteries.

There is an Exide built for every type of railroad work. And behind each Exide are the experience and reputation of the world's largest manufacturers of storage batteries for every purpose.

Photo courtesy of The Reading Co.

Exide

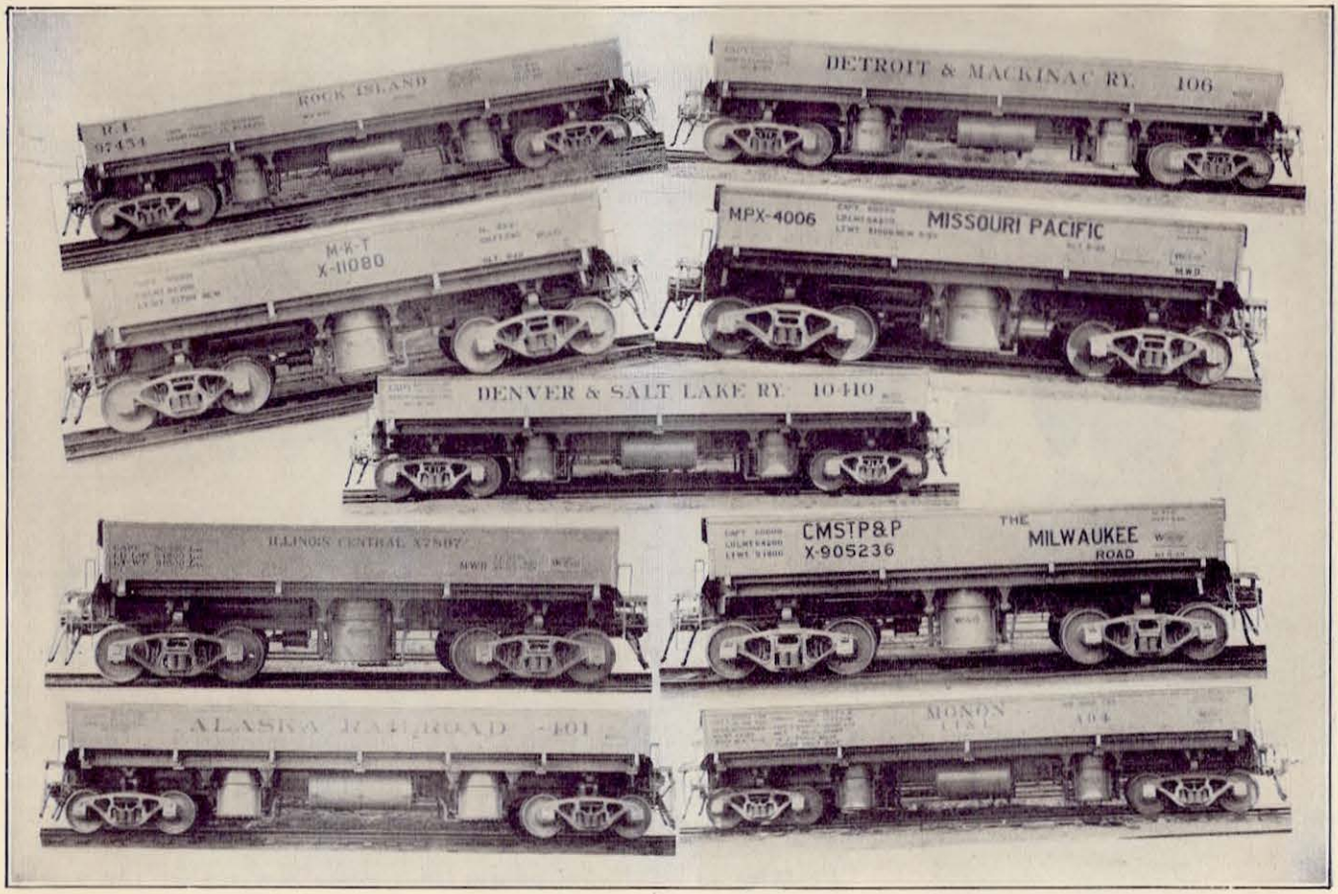
BATTERIES

FOR EVERY RAILWAY USE

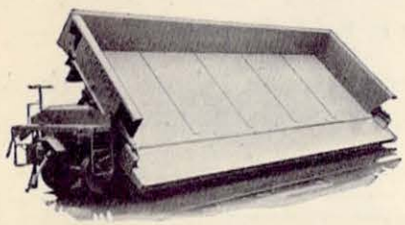
THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia

THE WORLD'S LARGEST MANUFACTURERS OF STORAGE BATTERIES FOR EVERY PURPOSE

Exide Batteries of Canada, Limited, Toronto



FURTHER COST REDUCTIONS CAN BE MADE



Western Drop Door Cars are built in all standard sizes. Their operation is safe under all conditions. They afford complete protection to track and ballast in dumping. They operate with utmost economy.

For instance, in maintenance-of-way the cost of the transportation of material can be reduced by the use of Western Drop Door Dump Cars. Railroads using Western cars, some of whose stencils appear above, have this cost down to rock bottom.

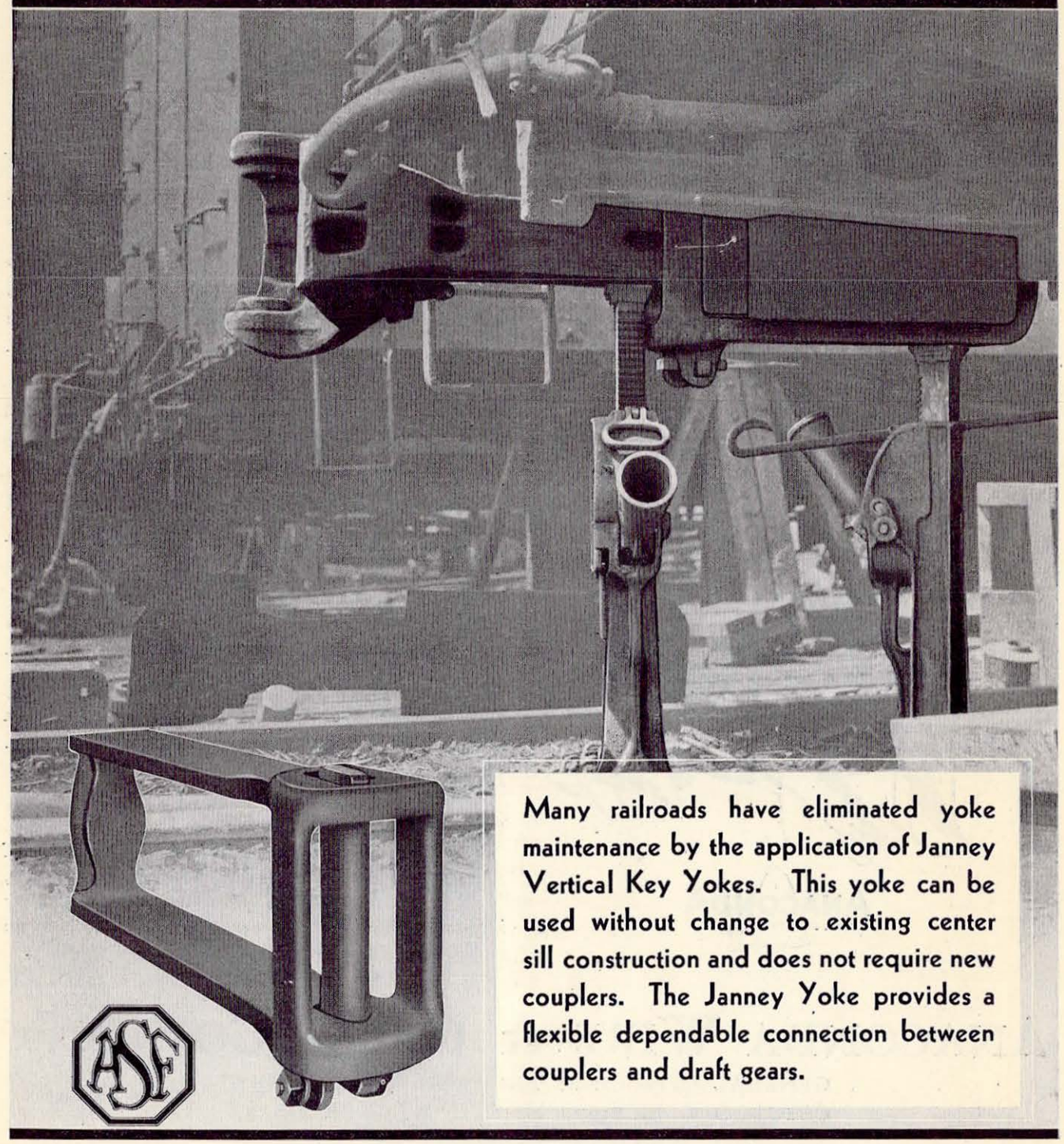
Western Drop Door Dump Cars are noted for strength, safety, and both low cost operation and upkeep. They are making remarkable records wherever they are used. Why not investigate? Catalog 81-N, giving complete description, is yours for the asking.

Western Wheeled Scraper Company

Aurora, Illinois, U.S.A.

WESTERN

Eliminate YOKE MAINTENANCE



Many railroads have eliminated yoke maintenance by the application of Janney Vertical Key Yokes. This yoke can be used without change to existing center sill construction and does not require new couplers. The Janney Yoke provides a flexible dependable connection between couplers and draft gears.

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

At *your* disposal

Broad, Well-Rounded Experience in Electrification Problems

ANACONDA
from mine to consumer

Anaconda has contributed to the success of every outstanding railway electrification project in the United States. Anaconda engineers have cooperated in the design of the catenary systems, and Anaconda mills have fabricated nearly 85% of the bronze wire and cable products for the exacting requirements of these electrifications—

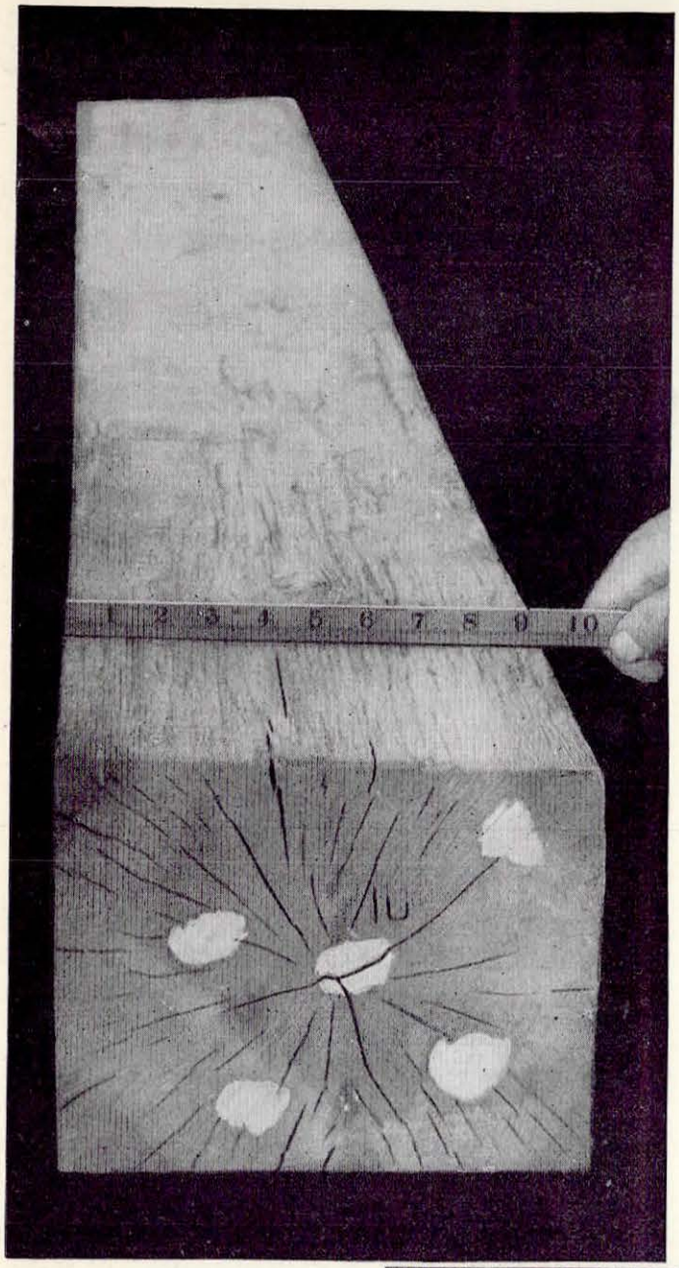
Milwaukee; Lackawanna; Reading; Great Northern; Pennsylvania; Illinois Central; Cleveland Union Terminal; Boston, Revere Beach and Lynn; Chicago, North Shore and Milwaukee; Southern Pacific—Key System Transit; New Haven.

To interested railway executives, Anaconda offers the facilities of an Engineering Department familiar with all electrification problems the services of a Technical Department with a background of more than a century of metallurgical experience.

81 ...Somewhere in Anaconda's offering of 81 different electrical wires and cables, you will find the items you use every day in your maintenance and extension work. Look for the Anaconda spear-head—mark of dependable quality.

ANACONDA WIRE & CABLE COMPANY

GENERAL OFFICES: 25 BROADWAY, NEW YORK
CHICAGO OFFICE: 20 NORTH WACKER DRIVE
Sales Offices in Principal Cities



GRADING

that saves cash and puts more timber under your rails

THE *International* policy demands that "every tie be a standard specification tie." And back of that policy stands an efficient and courageous inspection force that grades ties in strict accordance with the A. R. E. A. specifications.

The grade of every tie is determined with a rule and is marked plainly on both ends with paint.

All thicknesses and widths apply to the rail base—that section of the tie which is subjected to hardest wear—namely 20 and 40 inches from the middle of the tie.

Ties are never accepted in bulk because it is difficult to examine for decay and it is impossible to grade ties accurately.

International size-marks are your protection against overgrading—a money saving service, because the overgrading of ties one size is equivalent to an overcharge of several cents per tie.

Order your ties from *International* and benefit from the economies which are assured from these big sound ties.

International

CREOSOTING & CONSTRUCTION CO.

PRODUCERS OF HIGH GRADE TREATED TIES

Galveston - Beaumont - Texarkana

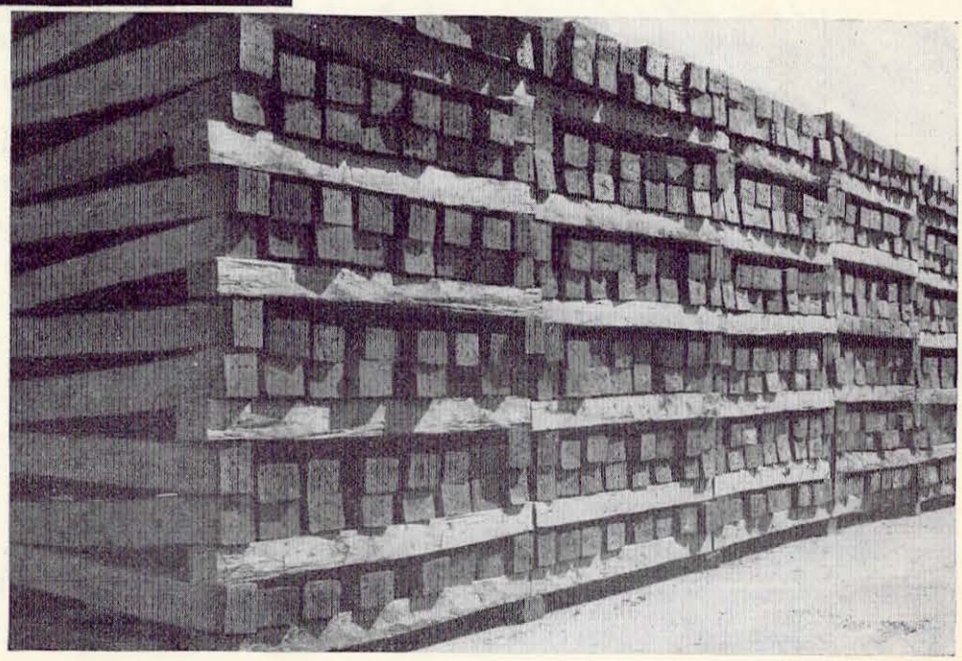
The extra timber makes ties last longer and cost less per year of service life.

3C1

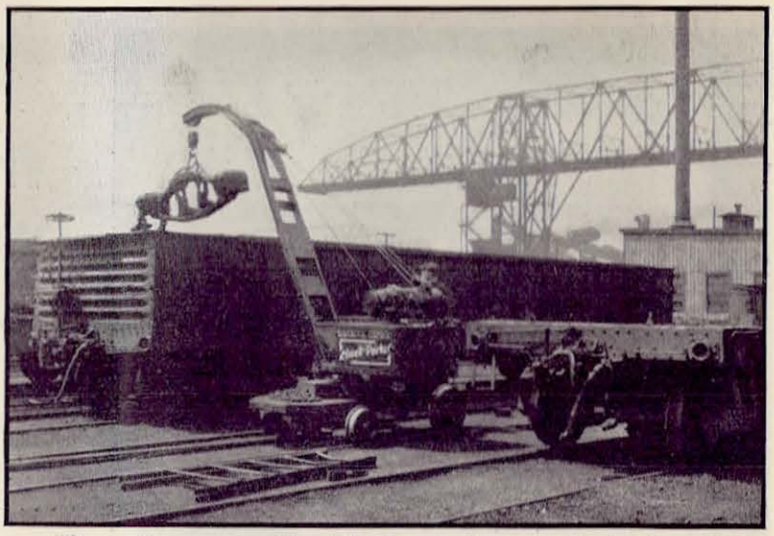
The International Dating Nail

This dating nail is your assurance that the tie is a Standard A.R.E.A. Specification Tie.

Full Size
Sound Timber
Properly Seasoned
Scientifically Treated

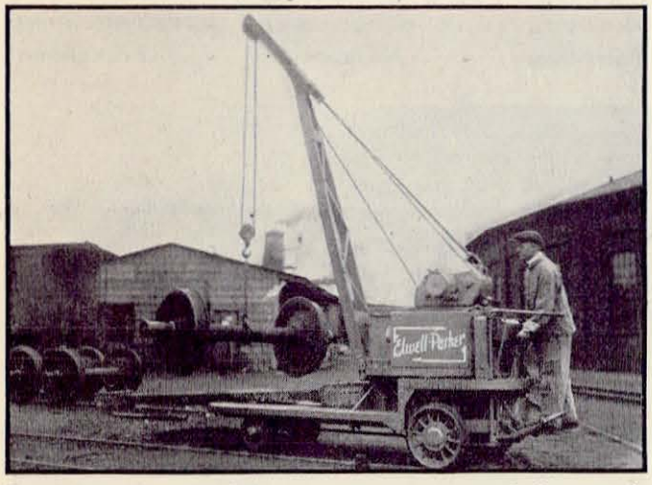


The repair track foreman will tell you, "Elwell-Parkers *Save a Lot of Money*"



Where advantageous, Elwell-Parkers can be equipped with flanged wheels to fit standard gauge track.

Here an Elwell-Parker crane truck with platform acts both as a load carrier and spotting machine as occasion demands.



Requiring only a hard surface on which to travel, these sturdy electrics are not limited to "set" routes.

ASK any foreman of a repair track where an Elwell-Parker truck is in operation what he thinks of the usefulness of the truck. He *knows* and he'll tell you he wouldn't be without it because it saves both time and money.

Pulling an axle from under a jacked-up car; hanging a coupler in the correct position; delivering a heavy jack, other tools or parts right to the spot where needed; loading thirty car axles in twenty minutes—these are just run-of-the-day jobs on which Elwell-Parkers speed repair track operations. Speedy repairs are especially important in keeping loaded cars on the move.

With the maintenance of equipment—rolling stock and locomotives—requiring approximately one-third of the average railroad operation cost, all possible saving that can be made in these costs warrants the attention of every railroad executive.

The nearest Elwell-Parker Field Engineer has enlightening information on the operations of Elwell-Parker trucks at railroad repair operations that may show you where *your* repair costs may be reduced. Write the Elwell-Parker Electric Company, 4250 St. Clair Avenue, Cleveland, Ohio, asking for details of how this valuable data can be of benefit to you.

ELWELL-PARKER

DESIGNERS AND BUILDERS OF ELECTRIC INDUSTRIAL TRUCKS, TRACTORS AND CRANES FOR OVER A QUARTER CENTURY

NORTH AND SOUTH RAILWAY
FREIGHT OFFICE REPORT

JAN 25 Date — 3381 Station

✓ INTERLINE RECEIVED
LOCAL RECEIVED
FORWARDED

WAYBILL Date	WAYBILL Number	Waybilling Road	WEIGHT	FREIGHT	ADVANCES	PREPAID
JAN 18	9434	526	6250	1094		1094
21	194	106	1820	855		
19	2656	535	55	164		
15	52	759	198	335		
19	27421	444	186	421		

NORTH AND SOUTH RAILWAY
STATION REGISTER

JAN 25 Date — 3381 Station

✓ INTERLINE RECEIVED
LOCAL RECEIVED
FORWARDED

FREIGHT BILL DATE	FREIGHT BILL NUMBER	NET DEBIT	NET CREDIT	CASH DATE	CASH AMOUNT	BALANCE
	6948	00*				
	6953	855*		JAN 26	855	
	6957	164*		JAN 26	164	
	6958	335*		JAN 29	335	
	6960	421*		JAN 29	421	
					20	
					353	
					1105	
					400	
					616	
					2114	
					788	
					106	
					194	
					155	
					344	
					5136	
					302	

NORTH AND SOUTH RAILWAY
FREIGHT OFFICE REPORT

JAN 25 Date — 3381 Station

INTERLINE RECEIVED
✓ LOCAL RECEIVED
FORWARDED

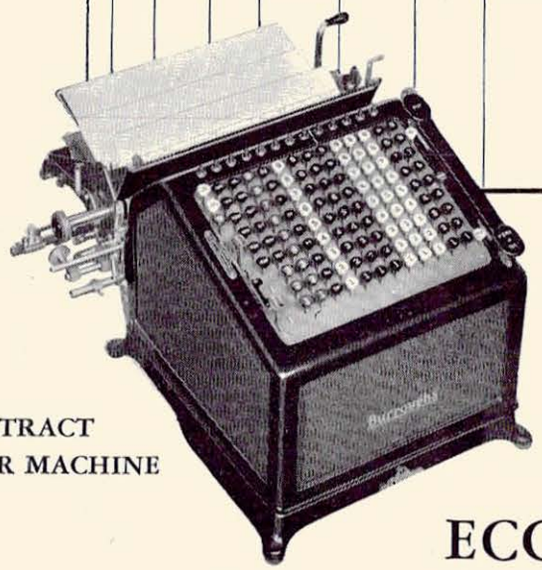
WAYBILL Date	WAYBILL Number	Waybilling Road	WEIGHT	FREIGHT	ADVANCES	PREPAID
JAN 25	50080			1012		1012
	50081			256		256
	50082			174		174
	50083			697		697
	50084			2160		2160
	50085			221		221
	50086			580		580
	50087			580		580
	50088			10647		10647
	50089			5148		5148
	50090				640	
	50091			488		488
	50092			302		302
	50093			99		99
	50094			120		120
	50095			163		163
				22647†	640†	22647†

NORTH AND SOUTH RAILWAY
STATION REGISTER

JAN 25 Date — 3381 Station

INTERLINE RECEIVED
✓ LOCAL RECEIVED
FORWARDED

FREIGHT BILL DATE	FREIGHT BILL NUMBER	NET DEBIT	NET CREDIT	CASH DATE	CASH AMOUNT	BALANCE
JAN 25	50080	1012*		JAN 25	1012	
	50081	256*		JAN 26	256	
	50082	174*		JAN 26	174	
	50083	697*		JAN 26	697	
	50084	2160*		JAN 28	2160	
	50085	221*		JAN 28	221	
	50086	580*		JAN 28	580	
	50087	580*		JAN 28	580	
	50088	10647*		JAN 29	10647	
	50089	5148*		JAN 29	5148	
	50090		640*	JAN 25	640*	
	50091	488*		JAN 30	488	
	50093	302*		JAN 31	302	
	50094	99*		JAN 26	99	
	50094	120*		JAN 26	120	
	50095	163*		JAN 26	163	
		22647†	640†			



Forms illustrated were written in one operation on Burroughs Station Abstract and Register Machine. Weight, freight, advances, prepaid, net debits and net credits to the station balance were automatically accumulated and totals printed in respective columns by a single key depression for each.

BURROUGHS
STATION ABSTRACT
AND REGISTER MACHINE

EFFECT FURTHER ECONOMIES IN YOUR ACCOUNTING DEPARTMENTS

New Burroughs machines, and recent improvements in other Burroughs machines, provide new possibilities of effecting further substantial economies in every department of railroad accounting.

Burroughs Station Abstract and Register Machine is only one among the many types and styles of these new machines especially designed for railroad work.

It will pay you to learn what Burroughs can do, not only to help you cut costs, but to aid you in speeding up and simplifying all your accounting.

Phone the local Burroughs office, or write direct to Burroughs Railroad Accounting Division in Detroit.

BURROUGHS ADDING MACHINE COMPANY—*Railroad Accounting Division*—DETROIT, MICH.

Burroughs

Today's Locomotives need *Stronger* Lagging

Two factors determine the force of any impact—mass and velocity. Modern locomotives are heavier—speeds are greater—consequently locomotive lagging must be stronger and more resistant to impact shocks.

It is self-evident that the lagging which best resists shattering will preserve its insulating value the longest. Furthermore, when the locomotive is overhauled, the salvage value of such lagging is greater. Carey 85% Magnesia Lagging has been developed to efficiently insulate modern locomotives. Reinforced with fibres of extra strong African blue asbestos and manufactured by a special process which insures even distribution of these fibres throughout the blocks, Carey Lagging adds unusual strength to high insulating efficiency.

Carey research engineers have perfected a testing method which determines the resistance of any locomotive lagging to impact shocks. This test is of great interest to executives who purchase lagging for either new equipment or replacement; complete details will be gladly supplied on request.

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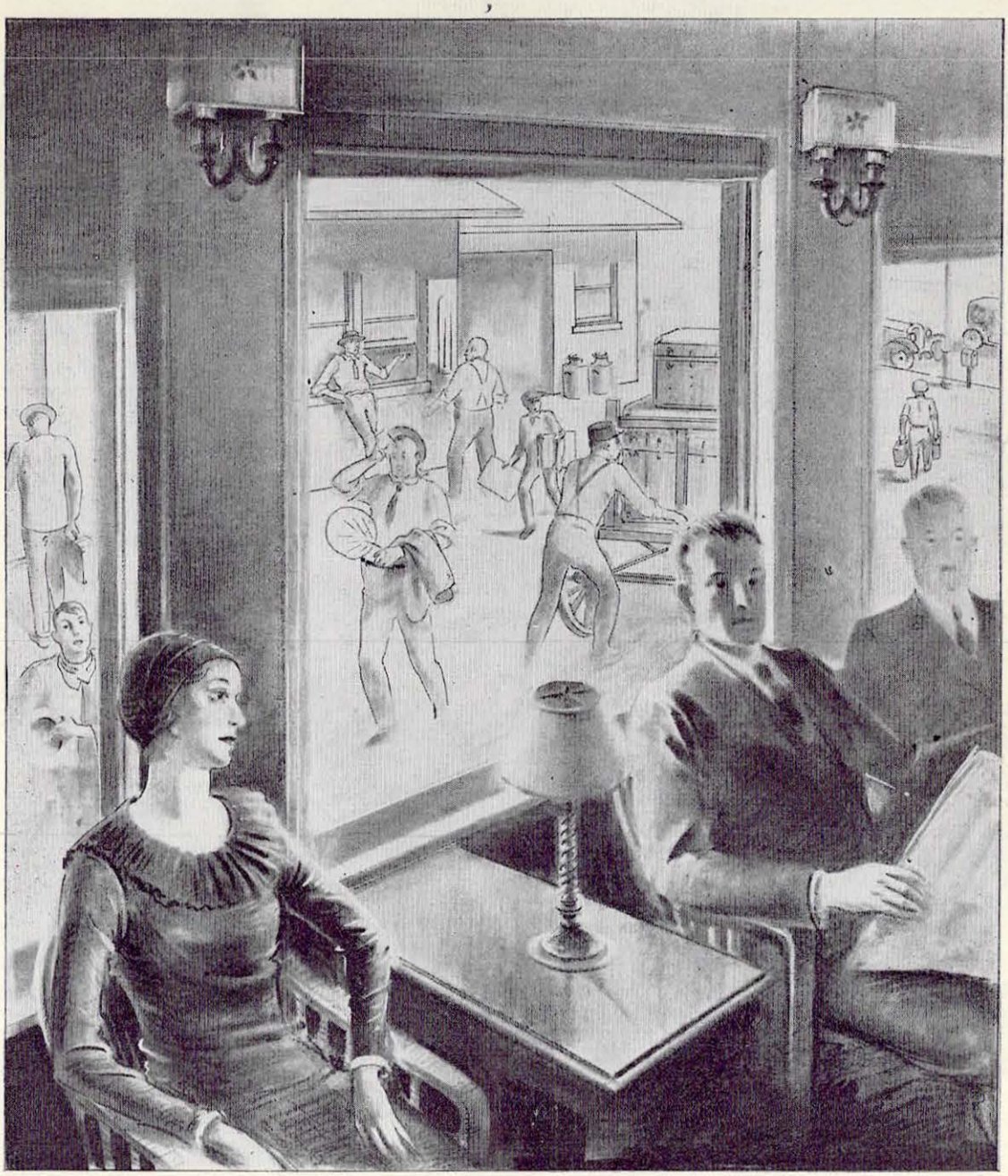

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A "WALKIE" for Business Men who Think that Typewriters are "Just Typewriters"

Tomorrow do a little "watchful walking"! Walk through your office.

WATCH YOUR STENOGRAPHERS WORK!

WATCH the girl who takes 50% longer to type a sales summary . . . because she hasn't a statistical machine.

WATCH the girl who takes 30% longer to type 100 cards . . . because her typewriter has no card-writing attachment.

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We find in America's offices no less than 124 different *kinds* of writing. So Remington makes a complete line of writing machines . . . indeed, the *only* complete line in existence. A model for each related group of uses!

And with 62 special attachments . . . with 55 varieties of type . . . with 3,066 keyboards covering professional needs, specific industries and all languages, not to mention 357 grades and colors of ribbons and 116 weights and colors of carbon papers. Remington Typewriters can be fitted to the specific writing need in your business like a glove fits a hand.

Telephone for a Remington Typewriter man. We promise to *prove* not only more satisfactory *typing* . . . but amazingly lowered costs. Remington Rand, Executive Offices, Buffalo, N. Y. Sales Offices in all principal cities of the world.

THE REMINGTON LINE OF TYPEWRITERS

built for specific purposes, is one of a variety of lines of office appliances and equipment manufactured and installed by Remington Rand . . . including Kardex Visible Records . . . Library Bureau Filing Equipment . . . Baker-Vawter-Kalamazoo Loose Leaf . . . Safe-Cabinet fire protection . . . Dalton Adding and Bookkeeping Machines . . . Remington Accounting Machines . . . and Powers Tabulating Machines.

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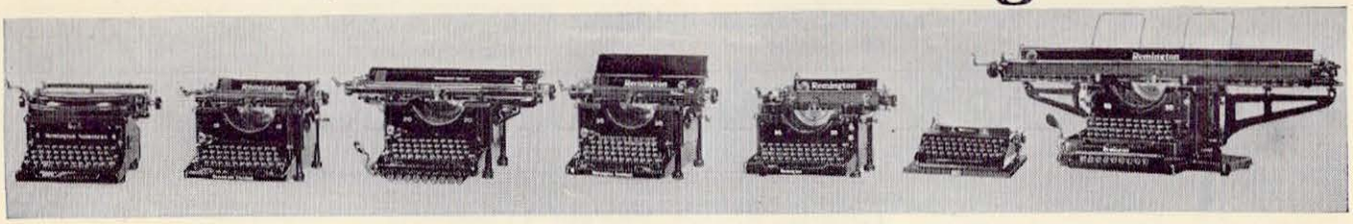
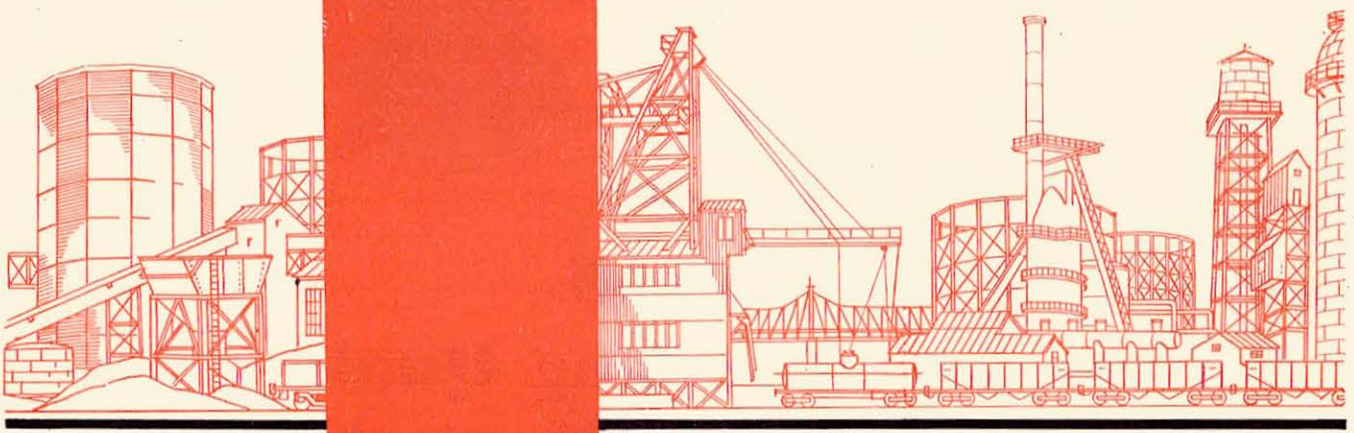


BUILDER OF TYPEWRITERS FOR SPECIFIC PURPOSES

WHERE RED SIGNALS SAFETY. . .



"DEPRECIATION" is a common enough word in accountants' reports, financial statements, and the like. But to the engineer and maintenance man, "depreciation" is more than a word—it's real . . . a steadily working, destructive force that must be checked if valuable property is to be conserved.

Red signals safety to those who are fighting depreciation in metal structures. Their own experience and the experience of their particular industry show the need for using pure red-lead to fight depreciation...to protect metal structures against air and moisture—the cause of corrosion.

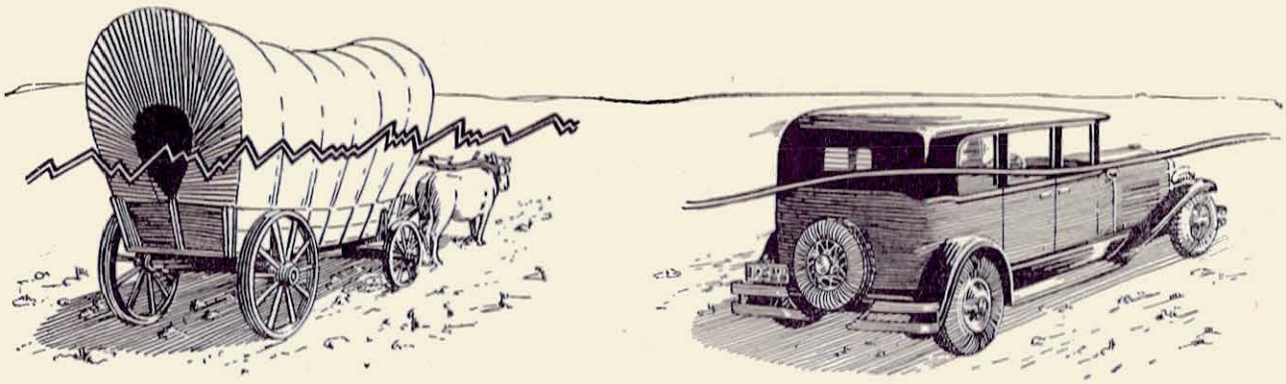
Red signals safety when the red is Dutch Boy Red-Lead. It's a fine, uniform, highly oxidized pigment which makes paint that sticks tight to metal. It makes a paint that works easily—that protects better—that wears longer.

Dutch Boy Red-Lead comes in both paste and liquid forms. The paste—Dutch Boy Red-Lead in oil—is the natural orange-red and can be readily shaded to darker colors. Dutch Boy Liquid Red-Lead is supplied in six colors—orange-red, two shades each of green and brown, and black. Let our Department of Technical Paint Service help you solve your metal painting problems. Ask our nearest branch for booklet—"Structural Metal Painting".

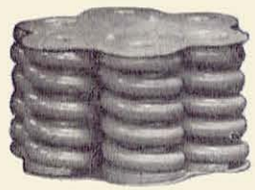
NATIONAL LEAD COMPANY

New York, 111 Broadway; Buffalo, 116 Oak Street; Chicago, 900 W. 18th Street; Cincinnati, 659 Freeman Avenue; Cleveland, 820 W. Superior Avenue; St. Louis, 722 Chestnut Street; San Francisco, 2240 24th St.; Boston, National-Boston Lead Co., 800 Albany St.; Pittsburgh, National Lead & Oil Co. of Pa., 316 Fourth Avenue; Philadelphia, John T. Lewis & Bros. Co., Widener Bldg.

DUTCH BOY RED-LEAD



Much of This
Difference in Riding Quality
Has Been Given to Freight Cars
by Bettendorf
Dalman-Type
Trucks

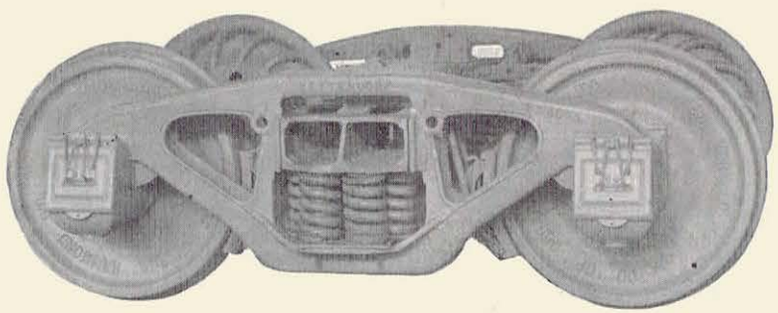


The Dalman spring group which gives Bettendorf Dalman-Type trucks ample reserve spring capacity and unusual shock absorbing ability, can now be furnished in a single cluster as illustrated above if desired.

The Dalman feature adds two standard coils to each spring group.

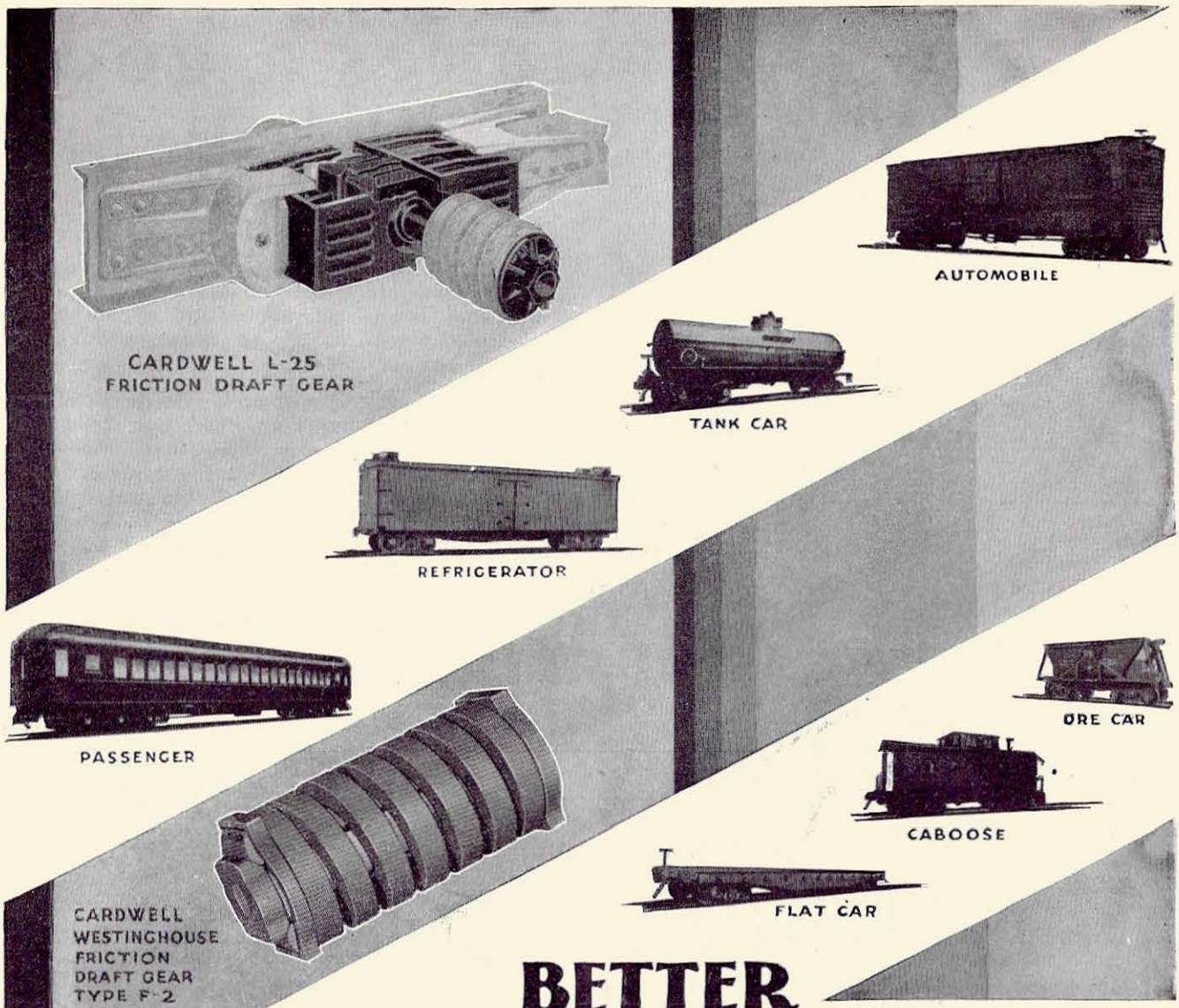
WHEN the covered wagon crossed the prairies, every stone and every chuck hole meant a distinct jar that brought fatigue to the intrepid souls aboard. Today the balloon tired automobile with scientifically designed spring suspension glides along with little thought to the contour of the road.

Much of this progress toward perfect roadability has been conferred upon the freight car by that highest development of freight car truck, the Bettendorf Dalman-Type. Your rolling stock is at its best when cushioned by the generous, scientifically arranged Dalman spring group. The economies inherent in the use of this improved equipment are obvious and considerable.

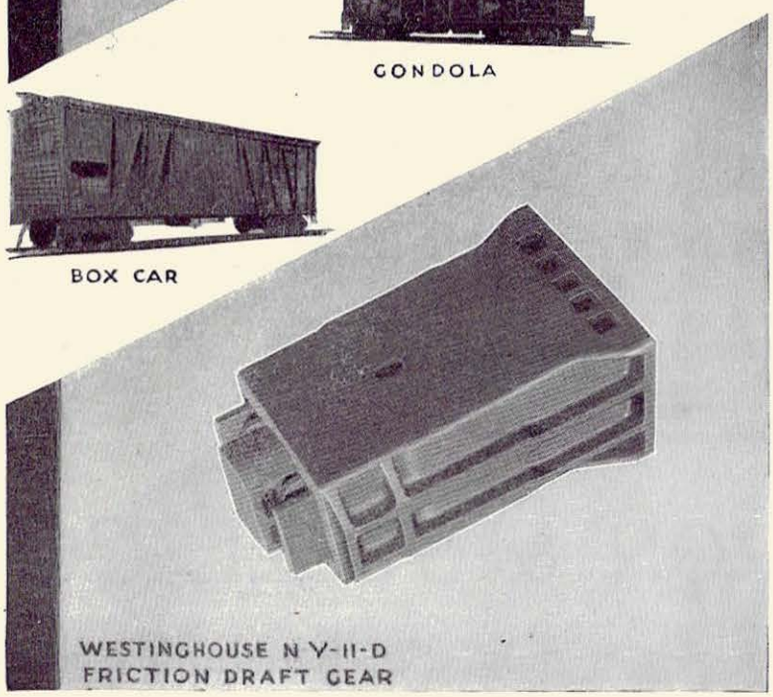


THE BETTENDORF COMPANY

OFFICES AND WORKS BETTENDORF, IOWA



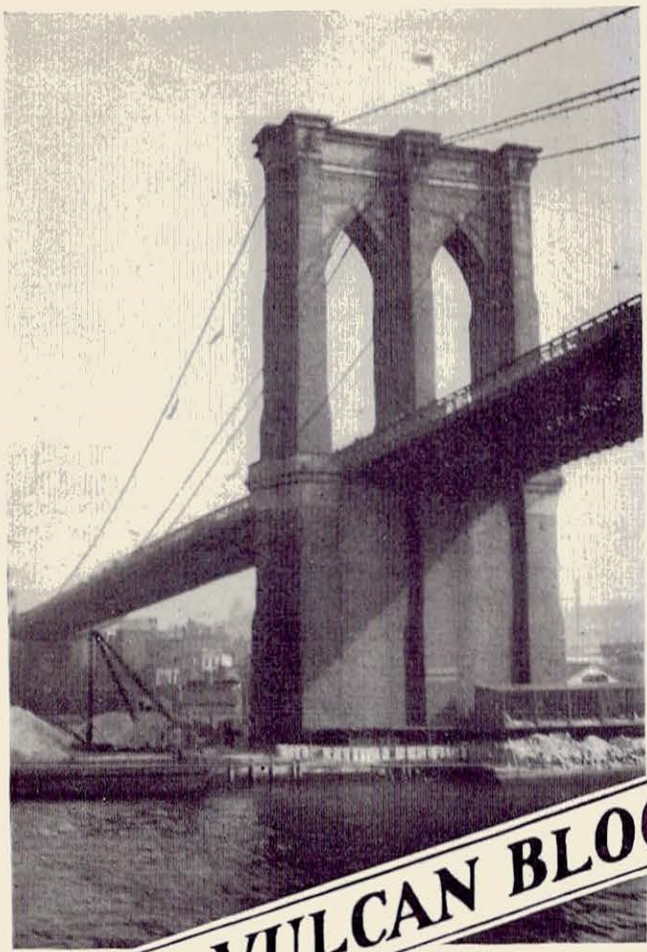
BETTER DRAFT GEAR PROTECTION *For Every Car*



INSURES reduced maintenance cost per car per year. Let us explain.

CARDWELL WESTINGHOUSE CO.
332 South Michigan Avenue
CHICAGO, ILL.

What Makes a good Staybolt or Engine Bolt?



THE giant suspension cables of the famous old Brooklyn Bridge are of a "built-up" structure, thousands of small wire interwoven make up these massive 18 inch supporting cables.

It is the same "built-up" structure of wrought iron giving a much higher resistance to extreme stress, vibrations, shock and corrosion that make it the most efficient, economical and dependable material available for staybolt purposes,—it is the one and only answer to what makes a good staybolt and Engine Bolt.

There are various qualities of wrought iron —there is a wrought iron of highest quality that has been unchanged for nearly half a century—if you want this quality just

Specify VULCAN BLOOM STAYBOLT IRON

There is a VULCAN IRON for every Railroad Purpose

VULCAN IRON FORGING BILLETS
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RAILWAY EXCHANGE,
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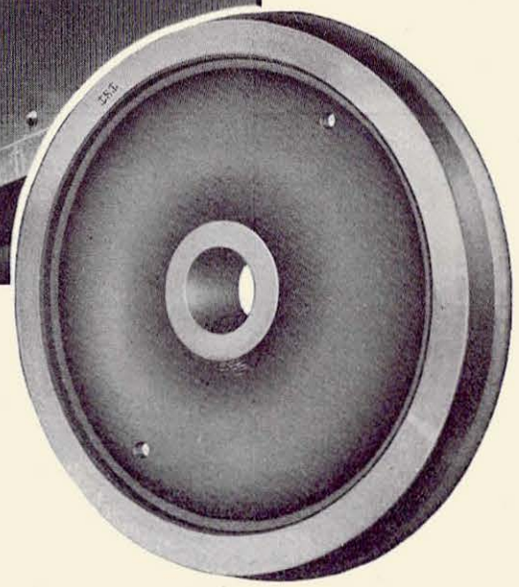
EWING GALLOWAY



Perfect maintenance of schedules depends not only on the human factor but also on the system and the equipment. "Standard" Q.T. wheels are showing g r e a t l y superior structural strength and wear. Their use simplifies part of the equipment problem — they keep r o l l i n g stock in o p e r a t i o n longer and lengthen the intervals between wheel replacements.

Tires
Rolled
Wheels
Steel Tired
Wheels
Forgings
Steel
Castings
Billets

STANDARD STEEL WORKS COMPANY

GENERAL OFFICE & WORKS:
BURNHAM, PENNA.

CHICAGO ST. LOUIS PORTLAND
NEW YORK AKRON SAN FRANCISCO
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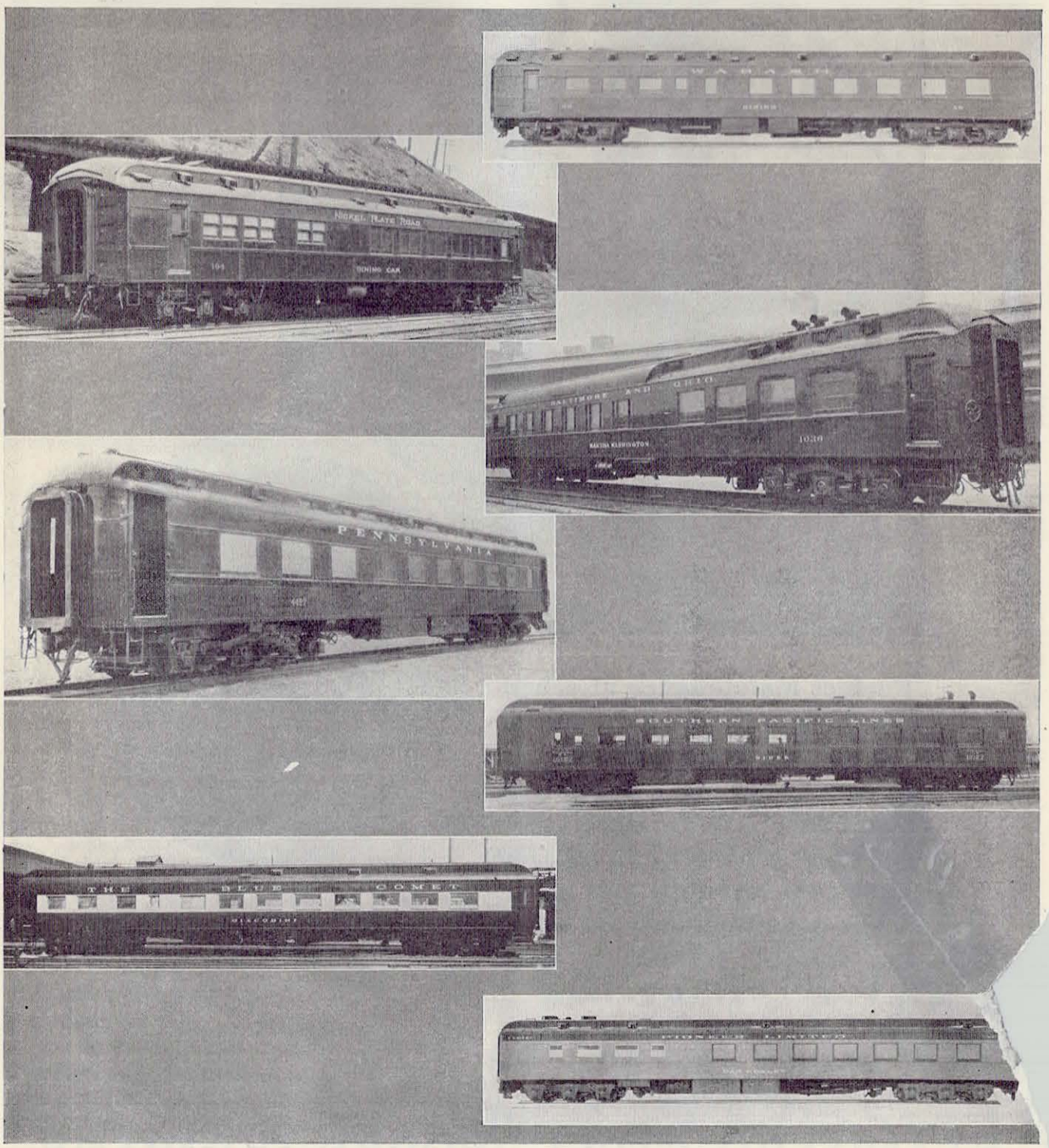
Passengers on many roads now



TIMKEN *Tapered Roller*

enjoy smooth-dining comfort

The dining car is unsurpassed as a good will builder. Good food, an efficient staff and a smooth-riding Timken-equipped car form a combination that calls forth more commendation than perhaps any other single feature of modern railroad service . . . Many railroads now give their passengers the comfort of Timken-equipped diners. A few are shown on the opposite page. It will pay you to put your diners and all other cars on Timken Tapered Roller Bearings.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

BEARINGS

This is not BALLYHOO

Less Than One Cent

per roof per year for maintenance

THE cost of roof maintenance, from 1913 to 1930 inclusive, on 30,000 Canadian National cars equipped with Dry Lading Roofs, amounted to $4,519,49.

The average maintenance cost per roof, per year, during this 18 year period, amounted to less than one cent.

This remarkable record is indicative of efficient management and a deserved reward of far-sighted vision.

It expresses the value of Dry Lading Roofs in terms of long trouble-free service and dollars and cents savings.

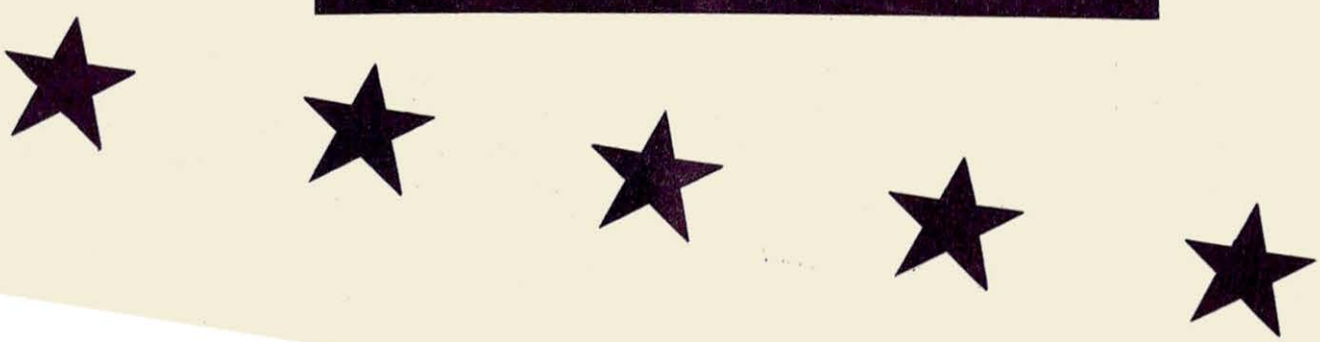
It proves that there is a vast difference between the mere purchase of roofs and really investing in a long term weather-proof roof service.

It proves that low price does not mean low cost but long service does. It's the cost per year that counts.

You cannot get around years of actual records. The Universal Dry Lading Roof is the greatest economical improvement in car construction.

Hutchins Car Roofing Company

but Food *for* Serious Thought



RAILWAY AGE

Effect of Regulation on Railway Stock Prices

The claim is often made that government regulation has not injured the railroads. Prior to regulation it is said they competed excessively and thereby injured each other, while regulation, by reducing their competition, has protected them from each other. References are also made to the assurance of a fair return given them by the Transportation act, and it is said that they are the only industry to which such assurance is given by the government. The implication of such statements is that the railways are relatively as well off as other industries and are better off as compared with other industries than they would be if they had not been regulated.

Refutation of such views is afforded by the statistics covering a period of almost thirty-five years which were given in an editorial entitled "Changes in Prices of Railroad and Industrial Stocks" which appeared in the *Railway Age* of September 26, and by other statistics with which we will supplement them in this editorial. Stock market prices are, of course, a very fallible measure of value. They are, in general, too high in proportion to actual values in a bull market such as that of 1929, and too low in proportion to actual values in a depression market such as the present one. Comparisons between the changes in such prices that occur over long periods are, however, illuminating. If, for example, over a long period the prices of one class of stocks average higher than the prices of another class of stocks, and then during another long period the relationship between the average prices of the two classes of stocks is reversed, it is plain that the comparative estimation in which they have been held by the investing public has changed, and that this change probably has been due to changes in actual values.

The lowest Dow-Jones average of prices of railroad stocks in 1897 was $48.12, and the "low" for industrials in the same year was $38.49. In 1906 the railroad stocks attained a high of $138.36 and the industrials a high of $103.00. During the period from 1897 to 1906, when general business was almost constantly improving, the railways were subject to some state and federal regulation, but it was comparatively ineffective; and not only did the prices of railroad stocks average higher during this period than the prices of industrial stocks, but they increased 188 per cent, while the prices of industrial stocks increased only 168 per cent.

Industrials Advance—Rails Decline

Effective federal regulation of railways was adopted in 1906 and rapidly become more restrictive. Between 1906 and 1916 the general trend of railway net return was downward. Both 1906 and 1916 were years of prosperity. In 1916 the highest point reached by the Dow-Jones average of railroad stock prices was $112.28, or 19 per cent less than in 1906, while the highest point reached by the average of industrial stock prices was $110.15, or 7 per cent higher than in 1906. Railroad stocks declined while industrials advanced.

In the decade 1916 to 1926 the railroads passed through years in which they suffered much more from adversity than did industrial corporations, including the years during which they were under government operation. In 1920, however, the Transportation act was adopted, and 1926 was the most prosperous year the railways have had since the war. In that year, after twenty years of effective regulation, the maximum average of railroad stocks was $123.33, or 11 per cent less than in 1906, when regulation was made effective, while the maximum average of industrial stocks was $166.64, or 62 per cent higher than in 1906.

At the heighth of the bull market in 1929 the maximum average of railroad stock prices was $189.77, or 37 per cent higher than in 1906, while the maximum average of industrial stock prices was $381.17, or 270 per cent higher than in 1906. On September 28, 1931, the railroad average was $55.85, or 60 per cent lower than in 1906, while the industrial average was $107.36, or 4 per cent higher than in 1906. In other words, the

net result of the changes that have occurred during twenty-five years of effective regulation of railways is, that *the average market price of railway stocks is less than one-half what it was in 1906, while the average price of industrial stocks is now, in the midst of the worst depression in history, actually higher than it was in 1906 in the midst of a period of great prosperity.*

The railway average was continuously higher than the industrial average from 1897 to 1918, but from 1906 to 1918 the difference was steadily growing smaller. The only part of the entire period of thirty-four years during which the railroad average increased relatively more than the industrial average was during the nine years from 1897 to 1906, during which years the railways had not yet been subjected to effective government regulation. The industrial average finally became higher than the railway average soon after the adoption of government operation, and has been leaving the railway average farther and farther behind ever since.

Should Regulation Be Abolished?

There can be no mistaking the significance of the facts presented. They indicate clearly that the railroads prospered relatively as much as industrial companies until effective regulation was adopted, and that they have prospered relatively less ever since. Under effective regulation their net earnings, and consequently the prices of their stocks, have constantly increased less than those of the industrials in periods of prosperity, and declined more in periods of depression.

To blame the managements of the railroads for their present plight, in view of such facts, would be utterly inconsistent. If they have not been as successful financially under government regulation as other industries have been without such regulation, this is plainly due to the kind of regulation to which they have been subjected. In a period of depression, when they are making the worst earnings in history, they are now appealing to the government authority that has exercised the most power of regulation over them for twenty-five years to give them relief from conditions which have been produced by that regulation. If that regulating authority cannot or will not give them the needed relief, then obviously regulation should be greatly reduced or even abolished.

Regulation was intended to protect the public from discriminatory or excessive rates, not to destroy the earning capacity and credit of the railroads. Everybody concedes that regulation to protect the public should not destroy their earning capacity and credit, because to do so would be absolutely contrary to the public interest. Profits in most other industries are regulated by competition. Railroads need reasonable profits as much as other industries, and if regulation cannot or will not let them be earned, then regulation should be withdrawn, and profits in the railroad industry be allowed to be determined as in other industries.

Better Merchandising to Increase Railway Revenues

It has been contended, and with patent justice, that the railways are being regulated because and as if they were monopolies, a situation which no longer exists. But can it not also be fairly said that the railroads themselves are in many respects continuing to do business on the assumption that they are monopolies, and are slow to adopt modern competitive sales and merchandising methods even where they are permitted without regulatory interference to do so?

At a country station about a hundred miles from a large city on a Sunday evening a few weeks ago there was a group of six persons who desired to return to the city by train. The agent, naturally, was not on duty and the station also was locked. There was no timetable posted on the exterior of the station and, the station being locked, no access could be had to the telephone booth to make inquiries at a larger station a few miles away. The party could not learn whether there would be a train within an hour or two, or whether perchance the last train for the day had already passed. In bygone days, with no other form of transport available, this group would have had no other recourse but patiently to wait for a train. The railway would have lost no revenues by its lack of consideration for its patrons' comfort and convenience. In the present instance, however, the group simply walked a block to a wayside refreshment stand which was a regular bus stop, learned when the next bus would pass and resigned themselves to the comfortless and slow bus journey as the lesser of two evils.

A woman resident of the same locality makes weekly trips to the city by automobile—with the belief that she is thereby economizing. Anyone really interested in selling railroad service to her and many others in a like situation, however, could easily show that the rate for a multi-ride railroad ticket is about half the direct cost—gasoline, oil, tires and repairs—of operating her motor car; pointing out, furthermore, that the journey by train is quicker, safer and more comfortable. Attractive posters in stations setting forth these facts would certainly tend to stimulate train travel in districts where multi-ride reduced rate service is offered.

At the end of daylight saving new timetables became effective involving many changes in schedules. One railroad, for some unknown reason, did not have the new public timetables available at all its stations for several days after the changes were effective. An occurrence unfortunate as this, however, might possibly be explained, although it was not, but how condone the further failure at least to instruct agents to post a list of available train service in each station until regular timetables could be distributed? The resulting inconvenience brought the greatest confusion and criticism and, undoubtedly some diversion of traffic.

But it is not alone in passenger service where better sales methods to meet a new competitive era are needed to replace practices which served very well at an earlier day. Freight service also requires the same new attitude of mind. There is considerable evidence to show that the loss of business to trucks has been due, not alone to rate cutting, but to their store-door delivery, overnight service, less onerous packing requirements and other factors. Is the loss of business resulting from these factors not due at least in part to the failure to revise railroad methods and service to accord with present day conditions, i. e., the complete and sudden disappearance of a former near-monoply? What steps are being taken to provide on the railways the service which is bringing the competitive refrigerated truck into general use, i. e., a provision by the railways for refrigerated service for small shipments?

Facing such facts squarely does not in any sense involve criticism. Conditions have changed so completely and with such lightning rapidity in the past few years that any organization which could have met them all without some failures would have had to be almost superhuman. There is the danger though in facing problems which are both gigantic and unexpected of overestimating their difficulty and being in a measure stunned into passivity by them.

There are critics of the railroads who find nothing good in their practices and who will not concede that they have made any changes to meet present day competitive conditions. Some even go so far as to say that the railroads should call in department store managers or industrial sales experts to take over the work of their traffic departments. Such critics overlook the fact that railroading is still railroading, with a technique all its own, and that the railroad giant is enmeshed in a network of regulation under which only those expert from long experience could carry on at all. Merchandising experts from outside the railroads facing such conditions would be, from ignorance, more hampered by railroad regulation than are experienced railroad men, however much the latter have still to learn about modern competitive merchandising.

Men who run the railroads must be railroad men. But cannot merchandising skill be drafted from the outside, without assigning the major job of railroading to them? When the farmer's crops are attacked by insect pests he secures the aid of trained entymologists, without at the same time turning over the main business of crop production and marketing to them. By the same token, while skilled vendors of chewing gum, radios or automobiles could not possibly be expected to assume control of any department of a railroad and make a success of it, might not the trained merchandising expert as a specialist still have something to offer to the railroads? In a consulting capacity might not such a man hasten a change in some of the practices which persist on the railroads as a heritage from an earlier day—conditions which are a costly anachronism in these days of perfervid competition?

Depreciation Accounting—Will It Reduce Rate Basis?

A railroad valuation expert, writing to us regarding the Interstate Commerce Commission's recent decision requiring depreciation accounting, suggests that the following paragraphs in the summary of that decision be read together in the order named. These paragraphs are 19, 20, 40, 41 and 21 and we set them down herewith as one paragraph as our correspondent suggests:

"The substitution of replacement cost or present value in determining the depreciation or retirement charge would involve a radical change in the accounting classifications. Under such practice the investment account would cease to reflect the costs which it purports to reflect. In the United Railways case the court was not passing upon accounting regulations or the authority to prescribe them. The principles are identical which govern the estimating of loss in service capacity for both accounting and valuation purposes. The same elements which produce depreciation for accounting purposes likewise produce depreciation for valuation purposes and they can not properly be observed and taken into account in the one case and at the same time be overlooked and neglected in the other. The sinking-fund, straight-line, and other methods of accounting for depreciation compared and for reasons stated the straight-line method approved. In the regulation of accounts the commission is performing an administrative function under the authority and direction of Congress and so long as the regulation is not arbitrary, in the sense of being without reasonable basis, there is no ground for judicial interference."

The court in the United Railways case viewed depreciation from a standpoint of valuation and its right so to do cannot be denied. Commissioner Eastman, who wrote the depreciation accounting decision, believes that the same elements which produce depreciation for accounting purposes also produce depreciation for valuation purposes and that these two views of depreciation cannot be considered independently. But, he argues, this decision is not subject to judicial review since in the regulation of accounts the commission is merely performing an administrative function. Is he not attempting to say to the courts: You have no right to interfere with us in our routine administrative practices even though these practices may lead us into fixing a valuation basis contrary to that established by law?

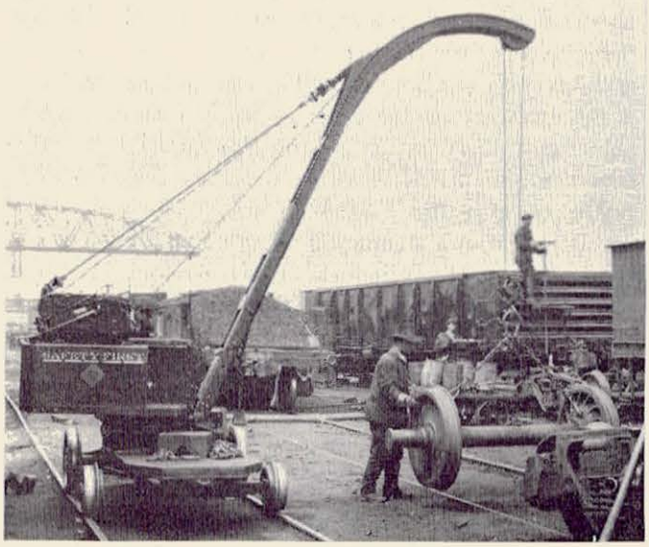
Perhaps we do not read the decision aright and perhaps we do. At any rate its wording seems to suggest the possibility of such an interpretation, which would do violence to the railroad rate basis, and, in view of this danger, we believe that the courts ought to be asked to interpret it and pass upon its validity.

Cutting Costs on the Repair Track

Modern equipment will speed up the work and increase output capacity so that substantial savings can be realized

FREIGHT car repair tracks, like the proverbial mushroom, spring up over night wherever switching crews are employed, or where there are "hump" or classification yards. The growth of these "rip tracks" depends largely upon the volume of business handled in the yard or terminal adjacent to which it is usually located. The rip track usually consists of a "dead" track which has no great value as a facility in the normal operations of the rest of the yard and hence, as a rule, is not very conveniently located in relation to the yard facilities. Because of this fact the rip track must be practically self supporting and in order to make this possible there is usually a small blacksmith shop and a small branch storeroom where supplies and parts are kept.

Freight-car repair tracks are more or less a by-product of necessity and, aside from being provided with a "force" and a few simple tools, usually come in for very little attention when new time-saving equipment is being considered. It is only a matter of time before most busy rip tracks assume the proportions of



Handling Car Wheels with a Crane Truck Cuts the Cost of Doing the Job

a real operation—many turning out from 75 to 150 cars a day—and their facilities are entirely inadequate for the number of cars which must be handled each day and the number of employes which are needed to care for the work. The result is that many cars which should be switched to the rip tracks to have work done on them are merely set aside in the train yard on tracks designated by the yardmaster and a small force of men is taken out of the regular force on the established repair track and sent to these tracks to "do what they can to get these cars moving." The result of this is that many cars are replaced in trains in such condition that they usually only reach the next terminal when they should be despatched in condition to reach their final destination.

In making a survey of railroad shops and yards to obtain information for these articles it was immediately apparent that if there is any place on a railroad offering a real opportunity to install some modern labor-saving material and material handling equipment and profit thereby it is in the average repair yard or "rip" track. While, of course, a great variety of work is performed in making light repairs to freight cars, most of the work on which modern equipment can be of help is in the handling of heavy car parts or materials. The figures given in this article deal mostly with these operations.

Unit Savings Not Affected by Size of Yard

Of four rip tracks from which information was obtained the output in cars repaired each day varied from 70 to 145 and the possible savings from the use of modern equipment when reduced to a unit basis seemed to apply equally well to the large and small yards. In one particular instance a yard having a total force of 39 men was making repairs to an average of 73 cars a day; 23 of these cars, due to lack of space and facilities, were being repaired in the open train yard with a force of six men which were drawn from the repair-track forces. The repairs required on the 50 cars that were spotted on the rip track were as follows:

9 Wheel defects, requiring renewal of wheels
5 Draft-gear slack, requiring addition of parts
2 Cracked arch bars requiring renewal
13 Defective air brakes, including broken brake pipes
6 Shifted loads
7 Broken safety appliances
4 Defective running boards
3 Broken couplers or parts
11 Broken or cracked center or draft sills
5 Broken center plates or loose rivets

The repairs made to the 23 cars in the train yard with the six men from the repair track were as follows:

9 Hot journals—Brasses renewed and boxes repacked
4 Running boards repaired
3 Brake beams applied
2 Slack in draft gear
2 Low couplers
2 Uncoupling levers bent
1 Brake staff bent

Of the 65 defects on the repair track 50 of them were repaired by the remaining 33 men in the gang. The 11 cars with cracked or broken sills were not repaired, nor were four of the cars that were shopped for broken wheels. Had it been possible to keep the extra six men on the repair track force all of the cars shopped for wheels would have been restored to service and the

cars with broken or cracked sills would have been well under way toward completion.

As to the cars repaired in the train yard at least three of the journals to which brasses were applied had slight scores in them which were likely to cause further trouble after leaving the terminal. Had these cars been placed on the rip track the journals could have been examined more carefully and, if necessary, the wheels renewed, thereby assuring that the condition of the car would be such as to reach its final destination, at least so far as hot boxes were concerned. The cars having low couplers were only temporarily repaired by placing a plate over the carrier iron instead of applying a liner under the center plate which could not be done in the train yard. The uncoupling levers and the brake staff were removed from the cars, taken to the rip track where they were straightened and returned to the train yard for application to the car. This movement of parts involved a loss of time and unnecessary expense.

A Portable Crane Would Help

Probably one of the most effective of time-saving appliances that can be used around the repair track is a power-driven portable crane. A crane of this type can be used for loading and unloading materials and scrap in the yard and for handling all of the heavy parts used in the actual work of repairing cars. Judging from the actual experiences of another yard of about the same size as the one mentioned above, it required seven laborers at $3.36 a day to handle material and scrap, by means of wheelbarrows, hand trucks and buggies. In addition the material delivery system under these obsolete methods was so poor that the car repairers on the job were required in many cases to go to the storerooms or the blacksmith shop for material or parts that should have been brought to them.

After the installation of a portable crane it was found that not only could all of the material and scrap be handled by four laborers at the same day rate, but also that the repair work could be performed with four less car repairers at $5.92 a day. The total daily savings in this case represented a figure of $33.76, or an annual saving of $10,128 based on 300 working days. The investment in the crane was $4,500 and the actual operating cost of the crane was $1,716.90 for a period of 300 days, or $5.72 a day. The operating cost included all charges, such as interest, taxes, insurance, depreciation and maintenance. Thus a net saving of $8,411.10 was realized annually—almost sufficient to pay for the equipment twice over in one year.

Removing and Replacing Wheels

Another major operation on the repair track is the handling of wheels. In one yard handling about 135 cars on the average each day it was found that about 50 of these cars—loaded cars in practically every case—required wheel changes. In another yard handling about 65 cars a day from 10 to 15 cars required wheel changes each day. In this work the use of air-motor operated jacks is gradually supplanting the use of hand operated jacks for raising loaded cars. Here, too, the portable crane aids in cutting down the time required to handle the wheels after the car is raised and the wheels rolled out.

In one yard, the operation of which requires the removal and replacement of an average of 30 pairs of wheels a day, the savings effected by the use of air-operated jacks amounted to 31 cents a car or a gross saving of $2,790 a year. The investment in power jacks to perform this work was $2,700 and the annual charge for interest, depreciation and maintenance on the new equipment was $513 a year, or a net saving of $2,283 annually. The saving in the specific operation of handling the wheels at the car by the portable crane was 26 cents a car, or $2,340 a year. The proportional costs of the crane operation charged against the handling of wheels on 30 cars a day was $180 a year or a net saving of $2,160. Therefore, in this case the use of the power jacks and portable crane resulted in an annual saving of $4,443 annually.

At another rip track it was found that wheels were shipped in from a central shop and were unloaded by means of a hand-operated chain hoist. This involved the use of three men for a total of 45 man-hours a week at a cost of $1,333 per year. A portable crane finally supplanted the former method of handling the wheels at an annual saving of $445.

Conclusion

The work on the repair track is more or less of a daily grind where manual labor has always been taken for granted. From the data obtained from an investigation of the possibilities of effecting economies at less than 10 repair points on several different roads, it is clearly evident that modern equipment such as that mentioned in the foregoing article can be profitably installed at any yard or repair point where 35 to 40 or more cars are handled each day with resultant savings that will, in many cases, entirely pay for the new equipment twice over in any one year. The repair track may be of relatively small consequence in the entire operation of the car department on a railroad, but the opportunities for cutting operating costs are proportionately as great as in the larger operations.

In Next Week's Issue

Winter's snows and summer's weeds are sources of annually recurring troubles for the railroads. Manual efforts to combat them are expensive, cumbersome and not infrequently inadequate. But thanks to the perfection of agencies long in use and the development of entirely new appliances, it is possible to cope with these seasonal problems and emergencies much more effectively and at a marked reduction in cost. Moreover, snow-fighting equipment offers far greater assurance against interruptions in service, while current practices in eradicating weeds promise a progressive decrease in weed growths that cannot be realized so long as hand weeding is done. Authoritative service records and reliable cost data afford conclusive evidence of the savings that can be made.

In a brief lecture on the duties incident to National Fire Prevention week, the New York, New Haven & Hartford calls the attention of officers and employees to the peculiar hazards incident to cold weather. The use of soft coal is increasing and the fact is noted that this fuel requires more care than anthracite; combustible material must be kept farther away from the fire. Of all the fires occurring on New Haven property last year, two-thirds resulted from six causes; and of these six, a single one—"matches—smoking"—caused nearly as many as the other five combined.

Constructs 50 Miles of Double Track on Embankment

Method of draining right of way and long haul of filling material add unusual features to this project

Filling Material Was Hauled as Much as 40 Miles

AS a part of a larger program of improvements which have been carried out over a period of years, designed to facilitate and reduce the cost of train operation, the Texas & Pacific has completed approximately 50 miles of second track between Johnson, La., and Addis. The more interesting features of the work were the method of draining the right of way in the low country which this section of the line traverses; the fact that for the entire distance the track is supported on embankment, the material for which had to be hauled for long distances, since the construction of borrow pits on or adjacent to the right of way was not practicable owing to the high level of the ground water; the installation of a system of centralized traffic control, in which both tracks are signaled to permit movements in either direction; and the electric lighting of all switch lamps.

This section of the road carries normally a relatively dense traffic, since, in addition to the regular movement of Texas & Pacific trains, it also provides the route for all Missouri Pacific traffic originating at or destined to New Orleans. In addition, it is located in the center of the sugar producing district of that portion of Louisiana west of the Mississippi river, in which there are 97 cane loading spurs, upon which approximately 450,000 tons of cane are loaded and shipped to the 20 refineries located on this line, in the course of a normal crop year.

During the cane-cutting season, which extends from about October 1 to January 1, all cane is required to reach the crushing mills the same day it is loaded. The loads are assembled from the cane spurs by specially assigned trains and brought to concentration points where they are made up into trains for movement to the refineries. The empties are then returned to these concentration points in train lots, from which they are again distributed for loading.

Added to this important and necessarily quick moving local traffic, the cane products, consisting of raw sugar, granulated sugar, molasses and bagasse, constitute in themselves a large and important traffic. The outbound movement of bagasse alone amounts to about half of the inbound movement of the cane to the refineries, or about 200,000 tons.

Owing to the volume of normal traffic moving over this section of the line, and particularly in view of the necessity for eliminating interference with through traffic by the greatly increased number of local movements during the cane season, it became necessary to construct an additional main track, and at the same time, to provide means whereby both tracks could be used to their maximum capacity.

From Gouldsboro, opposite New Orleans, the line was already double tracked to Waggaman, 10 miles. Single track extends from the latter point to Johnson, 27 miles, from which the new second track is continuous to Addis, 50 miles, except for a short gap across the drawbridge over Bayou la Fourche at Donaldsonville.

Drainage an Important Consideration

While a considerable amount of the drainage across the tracks can be cared for by means of relatively small pipe culverts, the numerous artificial drainage channels as well as some of the natural waterways required larger openings. All of the bridges over these waterways are creosoted pile trestles of the ballast-deck type, except where lack of head room made it necessary to install open deck trestles.

Between Gouldsboro and Addis, the line of the Texas & Pacific follows closely the west bank of the Mississippi river. For a considerable part of this distance the track is located near to or within sight of the levee. As a consequence the topography is flat and water is found close to the surface of the ground. For the entire distance the track is supported on an embankment which at no place exceeds 5 or 6 ft. in height. In general, lateral surface drainage is accomplished by means of drainage ditches which were constructed and are maintained by drainage districts to insure the dependable cultivation of the large sugar plantations which constitute the principal agricultural activity of this section.

As an important part of the double-tracking project, the right of way was graded for drainage by a somewhat unusual method, wherever the existing drainage was not entirely satisfactory. As mentioned, the land is flat and, since it rises only slightly above gulf level, drainage as it is known in higher or more rolling sections of the country does not exist.

Over a considerable part of the mileage involved, drainage was reasonably well cared for by the drainage ditches which have been mentioned. At other points the drainage was unsatisfactory or non-existent. To

provide drainage at these places the right of way was graded to a uniform slope away from the foot of the embankment.

A parallel ditch was constructed just inside the right of way line to keep the surface water as far from the track as practicable, the depth and gradient depending on the elevation of the outlet. The sloping surface of the right of way was then merged with the ditch at the bottom of its channel, so that on the track side it had no defined limit of width. Through this form of construction, the water, which under the best conditions of flow is quite sluggish, is kept a maximum distance from the track and stagnant pools on the right of way are eliminated.

Drainage Grading Was Station Work

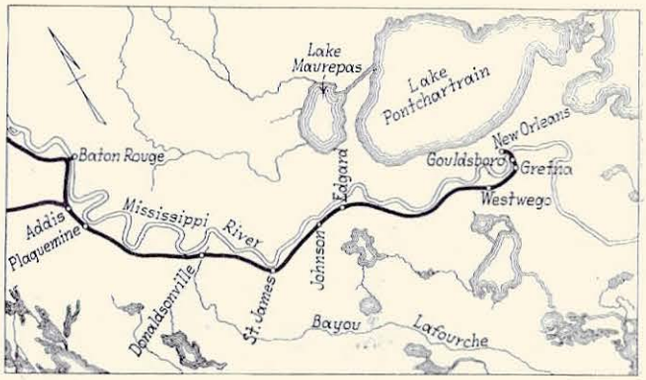
Since the depth of the excavation seldom exceeded 2 ft. at the right of way line, and was frequently less, and decreased to zero at the foot of the embankment, the entire operation was one for hand methods, particularly as some of the soil that was handled was more or less water-logged. For these reasons, the contractor did the work either with his own forces or sublet it on a station, or "humper" basis. The grading was done by the workmen, either singly or in small groups, with hand shovels and wheelbarrows. The drainage grading was kept ahead of the train haul and the excavated material on the side where the new track was located was used to construct the base for the second-track fill. On the opposite side it was used to restore and strengthen the existing shoulder.

Owing to the fact that side borrow was not practicable, the contractor who placed the remainder of the fill purchased an area of high ground about a quarter of a mile south of the main line at Donaldsonville and opened it as a borrow pit. The material was loaded into Western, 12-cu. yd. hand-dump cars with a crawler-mounted dragline, using a 2-cu. yd. bucket. The cars were hauled to destination by the contractor's own power, and the material was spread to a width of 26 ft. from the center of the existing track with a Jordan spreader. The total amount of grading involved was 262,000 cu. yd.

An Unusually Long Haul

While the main pit was at Donaldsonville and the bulk of the filling material was obtained at this point, other borrow pits were opened at Oak Alley and Westwego to shorten the haul as much as practicable. The maximum haul was 40 miles, while the average for the project was 20 miles, an indication of the difficulty encountered in obtaining suitable grading material in this section of the country. For hauls exceeding five miles, the trains consisted of 40 cars, while below that distance 24-car trains were operated.

A track gang, varying in size according to requirements, maintained the loading spur and shifted the pit tracks. Since the material was river silt without any gravel or segregated sand, the pit force did not exceed 2 or 3 men during the entire operation, which extended from May, 1928, to November. Ten men accompanied the train to dump the cars and 2 or 3 men were usually



Map Showing Location of T. & P. Second Track

left at the point of most frequent dumping to trim the shoulder behind the spreader. Only one shift a day was worked.

Every effort was made to send the trains to the farthest available dumping point, with the idea of holding the closer points for use when the movement of revenue trains would interfere with the longer runs. The actual distance reached on any run depended, however, on the conditions surrounding revenue train schedules at the moment, and the points that could be reached with a minimum of delay.

Track Placed in Service Progressively

Tracklaying by railroad forces followed the completion of the embankment and the new track was placed in service in sections as rapidly as the ballasting and the signal installation were finished. During the interval between ballasting and the completion of the signals the new section was used as a long passing siding by freight trains. The rail on all new work is of the A.S.C.E. 85-lb. section, supported on creosoted ties and full tie plated.

Originally, the existing main track was ballasted with

(Continued on page 510)

Loading Cars at Donaldsonville Pit with a Crawler-Mounted Dragline

More Economical

Handling of Stationery

on the Southern Pacific

Thousands of dollars saved annually by systematic control of forms and office supplies

Reproducing Equipment a Stationery Saver

SYSTEMATIC studies of stationery costs, centralized control of forms, special buying studies and more orderly accounting and supply have continued to be a source of economies for the Southern Pacific lines, according to M. E. Maurer, consulting office supervisor, Southern Pacific, Pacific system, San Francisco, Cal. Committees now determine the kind and number of forms to be used, bureaus look after the reproduction work and office appliance servicing, central storehouses guard the inventories and supply the needs, and the use and replenishment of the supplies are all closely supervised under present methods.

Over 3,000 Forms Cancelled

The possibilities of economy through centralizing control of stationery forms was recognized several years ago by the accounting department. The savings effected in that department by a committee of accounting officers of the several system lines led to the appointment, in 1917, of a committee of operating, traffic and motive power representatives to review the stationery forms of those departments. After the first survey, over 3,000 forms, or 44 per cent of the total reviewed, were discontinued, and 850 forms, or 12 per cent of the total, were revised to obtain improvements of form or reductions in cost.

Stationery Forms Committee Organized

After a time it became apparent that, while periodic surveys were productive of much economy, the steady increase in stationery costs resulting from the rapid growth of traffic and the increase in the number of clerks required closer supervision and a permanent stationery forms committee was appointed, in 1925, on each of the system lines to control forms other than those for accounting. The accounting committee, previously established, continued to function separately in controlling accounting and treasury forms and methods, under the direction of the general auditor, while each of the general committees is headed by an officer appointed by the president or executive vice-president. These committees are composed of representatives of the executive, traffic, operating and motive power departments, the executive department also representing the stores, purchasing, law, land and hospital departments.

The chairmen and committeemen conduct the work of the committees in conjunction with their regularly assigned duties, except that the volume of operating forms has required the operating representative to devote full time to the committee work. This representative is aided by division committeemen, one man on each superintendent's division being delegated to handle stationery forms in conjunction with his regular duties. A supervisor and a file clerk in the office of the committee at San Francisco maintain records and conduct the routine and general correspondence.

A Record of Each Form

Every stationery form carries an identifying number and title, while letter prefixes to the form numbers indicate whether the form is temporary, local, standard or common standard. Local forms are those used only on the line originating the forms. Standard forms are those which allow printing a single stock for one or more lines, or forms which are similar for all system lines, except for the company's name, titles of officers, or names of locations, and sometimes other minor differences which do not require re-setting an entire form in printing. Common standard forms are those used by two or more lines, which can be printed as a single stock, and include bound book forms having individual company names printed only on the outside cover.

Duplicating Bureaus

The approval of individual committee chairmen is required to establish or revise any temporary or local

form, and agreement between the chairmen of the several committees must be reached before standard or common standard forms are established or revised. The committees are aided in policing stationery forms by the stationery storekeepers, purchasing agents, and the managers of the duplicating bureaus, under whose direction forms are printed or processed. In the duplicating bureaus, located at several points on the system, has been centralized most of the hectographing, mimeographing, multigraphing and addressographing work produced for all departments. In addition, considerable printing is done in the duplicating bureau of the company at San Francisco. Each chairman of the stationery committee issues a monthly report showing the number of forms of each class received for review, and their disposition.

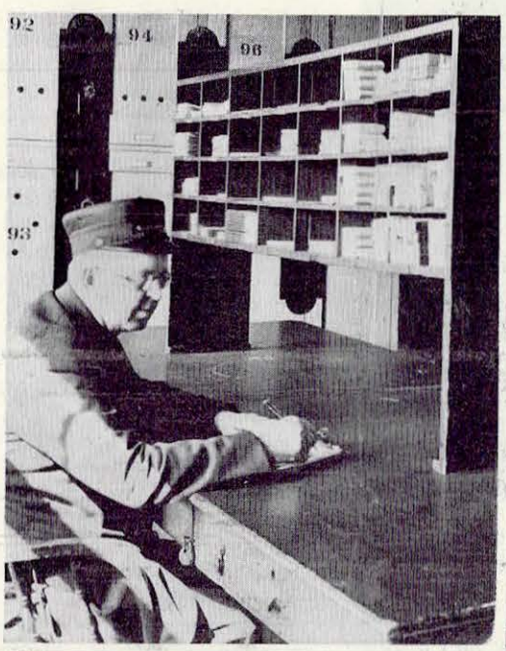
A $62,000 Saving

Since the appointment of the general committee in 1925, 35 per cent of all the forms reviewed have been discontinued, and over 9 per cent have been revised. In addition, changes in the weight and quality of paper used have been made in a large number of instances. No attempt has been made by the committees to accumulate a complete record of the economies. An example of what has been accomplished is afforded, however, by the savings made in 31 major changes in stationery forms brought about by the committees, totaling over $62,000 annually, consisting of a $35,000 reduction in stationery costs and a $27,000 payroll reduction. In addition, these changes saved 6,000 clerk-days annually, so scattered among departments, bureaus and jobs as not to permit payroll reductions, but providing time needed for other work.

Supervise Printing

Aside from avoiding the expense of printing forms not justified by their constructive uses, the committees control the make-up and size of forms, weight and quality of paper, color of paper and ink. Expensive ledger and bond papers are replaced, wherever practicable, by sulphite bond or chemical papers; card forms, formerly printed on glazed or unglazed Bristol board, or on Iron Tag, are being superseded by lighter weight and cheaper tag or material known as B fibre. Envelopes for interdepartmental and inter-railroad use are printed on brown kraft instead of manila paper. Re-use envelopes having spaces for 12 successive addresses, and with ungummed flaps, are used for ordinary interdepartmental correspondence. White paper is substituted for colored wherever color distinction is not justified. Printing the headings, captions, and ruling of some forms in one color—generally black—has been widely adopted. In some cases, green ink is used to avoid eye-strain. In other cases, one color of ink for the entire form gives the distinction formerly accomplished by the use of colored paper.

Instructions for the printing of each form often permit reductions in sizes or afford space for more entries, and sometimes permit printing on only one side instead of both sides. Likewise, condensing the headings and captions and printing them higher on the sheet to permit more entries has reduced the number of forms



Stationery for Passenger Conductors in Their Locker Rooms at Terminals

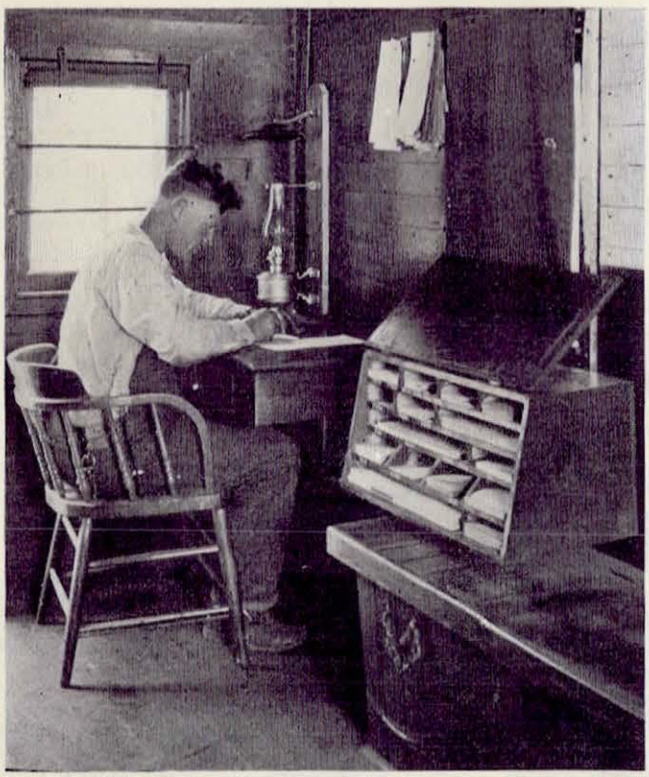
Yardmasters' Office and Outlying Ticket Office Practice

required for certain purposes. Continuous manifold forms for large operations are saving labor and speeding up output.

The same fundamentals for controlling the supply and distribution of the larger materials are now used in controlling stationery items on the Southern Pacific lines. The expense is no longer charged direct to operating expenses when it is received. The supply required for the 1,500 to 3,000 offices using stationery is centralized at a store where efficient facilities are provided for expeditious service and a force employed that is trained in handling, inspecting and ordering stocks in quantities that will result in attractive prices and minimum investment.

Office Appliances Help

Since stationery cannot be handled many times without becoming dog-eared, wrinkled and unfit for use,



The Freight Conductors' Stationery is Kept in a Portable Cabinet Serviced Each Trip by Stockkeepers

special stationery cabinets are provided in the large offices that automatically control the quantity and protect the stock. In buildings where large quantities of stationery are used, the working supply of stock is kept in one place in charge of an employee reporting to the stationery storekeeper. In offices of the size of superintendents', the stationery is kept in a room equipped with a mimeograph machine, a schapirograph machine, a dictaphone shaving machine, a binding machine, etc. Stocks used by train crews are placed in stationery kits containing only such quantities as are required for a few trips, and the storeman supplies the stationery much the same as he does fusees, torpedoes, packing, oils, etc.

While stationery and printing comprise only about 2½ per cent of the total expense for railway material, the expenditure reaches several million dollars annually on a road the size of the Southern Pacific, and has made it correspondingly important to apply businesslike methods to its purchase, care and use.

Constructs 50 Miles of Double Track on Embankment

(Continued from page 507)

gravel dredged from the Mississippi river. This had never been satisfactory because it contained so large a proportion of fine material and silt as to block the drainage seriously. Its use had been continued, however, for lack of a convenient supply of suitable ballast material. Recently a deposit of gravel of much higher quality has been developed at Forest Hill, La., on the Red River & Gulf, a logging road which joins the Texas & Pacific at Lecompte, La., about 90 miles west of Addis, giving an average haul of about 125 miles on this project. Within the limits of the second-track construction the old ballast was replaced with this better material, which was also used on all new work, the total amounting to 157,000 cu. yd

Centralized Traffic Control

To insure maximum use of the increased trackage in this territory both tracks were signaled to permit movements in either direction and a system of centralized traffic control with color-light signals was installed. High speed crossovers were located at strategic points, and centers of control were established at St. James, Donaldsonville and Plaquemine, at each of which points 24-hr. telegraph service was necessary in any event. The control points thus selected give a greater degree of local supervision of train movements, as well as simplify the control circuits, since the train dispatching headquarters for this territory are at Alexandria, La., 100 miles west of Addis.

Each of these operators maintains control of the switches and signals within defined limits, and train operation is directed entirely by signal indication. The control circuits extend to Edgard, the first passing siding east of Johnson. All crossovers for non-stop movements and the switches at the ends of double track at Johnson and Donaldsonville are power operated and controlled remotely, while a spring switch is provided at the end of double track at Addis. All other switches are hand thrown.

As a result of the flexibility provided in this installation, it was unnecessary to provide a series of passing sidings which would otherwise have been required. Owing to the fact that power is available in connection with the signal and switch-control installations, lighting circuits were provided for the electric lighting of all main-line switches.

The entire project was carried out under the general direction of E. F. Mitchell, chief engineer. E. P. Weatherby, signal engineer had charge of the signal installation. Gifford-Hill & Co., Dallas, Tex., had the contract for placing the train fill and supplied the ballast. Robert Wooten, Ft. Worth, Tex., did the drainage work. The track laying and surfacing was done by company forces. The signal installation, including the construction of the pole line, was made by the signal department of the railway. The signaling and switch material and equipment was furnished by the General Railway Signal Company.

The Emergency Unemployment Relief Committee of New York City has appointed John G. Walber, vice-president of the New York Central, as chairman of the Commerce and Industry Division.

Colonel Edward A. Simmons Dies

Death claims publisher of Railway Age and associated publications in midst of career of achievement

COLONEL EDWARD A. SIMMONS, president of the Simmons-Boardman Publishing Corporation and affiliated companies, publishers of *Railway Age,* died of a cerebral hemorrhage at his home in Brooklyn, N. Y., on September 30. Colonel Simmons was in his fifty-seventh year and had been continuously associated with the Railway Age and its predecessor publications for 42 years, having as a youth of 14 joined the organization he later came to head.

Edward Alfred Simmons, Born March 20, 1875; Died September 30, 1931. Served the Railway Age 42 Years, 20 Years as President of the Simmons - Boardman Publishing Company

Edward Alfred Simmons was born in Brooklyn, N. Y., on March 20, 1875, and was educated in the public schools of that borough. He entered the service of the Railroad Gazette in a subordinate capacity in September, 1889. His ability being quickly recognized, it was not long until, in spite of his youth, he had attained an important post on the sales staff of the magazine, from which he was subsequently promoted to the business managership. In 1911 Colonel Simmons effected the merger of the Railroad Gazette with the Railway Age (Chicago), becoming president of the new company formed to take over the properties. This company, under his leadership, also initiated or acquired the following transportation periodicals: Railway Mechanical Engineer; Railway Engineering and Maintenance; Railway Electrical Engineer; Railway Signaling; Marine Engineering; The Boiler Maker; and Airway Age. In 1926 the Railway Review was acquired and combined with the Railway Age.

In 1929 the Simmons-Boardman Publishing Corporation was formed under the presidency of Colonel Simmons, acquiring control of all the transportation papers heretofore mentioned, and in addition thereto the American Builder and the House Furnishing Review. With the American Builder have since been combined the Building Age and several other publications in that field, giving it a position of eminence comparable to that attained by the Railway Age and its sister publications in their service to the railway industry.

During the World War, Colonel Simmons served with the Quartermaster Corps, being commissioned a major in 1918. After the war he was elevated, first to a lieutenant-colonelcy and then to a colonelcy, in the Officers' Reserve Corps, Quartermaster Section. He took a keen interest in military affairs and was a member of several military societies. He was prominent in the work of the American Legion, of which he was past commander for Kings County. He served a term as president of the Brooklyn Chapter and another as president of the Department of New York of the Reserve Officers' Association of the United States. He was a member of numerous clubs, principally in New York, Philadelphia, Washington, and the Adirondacks. At the time of his death he was a member of the board of governors of the Railroad Club of New York.

Always maintaining an active interest in railway affairs, Colonel Simmons was likewise identified with engineering and marine matters. An associate member of both the American Society of Mechanical Engineers and the American Society of Civil Engineers, he served as chairman of the endowment committee of the Engineering Foundation, Inc. He was a member of the Society of Naval Architects and Marine Engineers and chairman of the American Marine Standards Committee. As a publisher he took a keen interest in that business, was widely acquainted among its leaders and active in co-operative endeavor looking toward its welfare. Among his business interests in addition to that as a publisher, was that of machinery manufacture. He was chairman of the board of the American Saw Mill Machinery Company and president of the American Saw Works, and occupied both these executive posts in the American Machine Tool Company.

Colonel Simmons' career was an ever-expanding one. Each year brought enlargement to his business and civic activities, involving a pressure of work which

doubtless latterly put a strain upon even such a vigorous constitution as was his. He was chairman of the United States delegation to the International Railway Congress at Madrid in 1930 and was actively identified, although always in a lay capacity, with political affairs both local and national. A lover of outdoor life, he served as president of the New York State Division of the Isaac Walton League of America, and his happiest hours, when business duties permitted, were spent with his family in the Adirondacks, where at Eagle Bay, on Fourth Lake, his country seat, Albedor, is located.

Edward A. Simmons—A Tribute

By Samuel O. Dunn

ON September 30, 1931, the day on which Colonel Simmons died, he completed a service as president and I a service as editor-in-chief of the Railway Age and its affiliated publications of exactly twenty years. I cannot refrain at this time as an editor from paying tribute to him as one of the fairest, most satisfactory and most courageous publishers to whom any editor ever reported.

Until October 1, 1911, W. H. Boardman was both president and editor. The company at that time had two papers, the present names of which are Railway Age and Railway Signaling. At the time of Colonel Simmons' death it had ten papers. As each paper was acquired my jurisdiction as editor-in-chief was extended over it.

During the entire twenty years Colonel Simmons never issued a single order that any editorial, article or item should be published in or omitted from one of these papers, or that any editorial policy should be adopted, changed or abandoned. His course in this respect was not dictated by expediency, but by principle. Like every publisher, he desired that the company of which he was the head should be financially successful. His fundamental principle as a publisher, however, was that a business paper should be published primarily to render the greatest possible service to the industries in the field that it covered. He believed that such service could be rendered only by a paper that published the most complete and accurate information that it could get regarding all the developments in the field, and that boldly criticized unsound policies and advocated sound policies, regardless of any fears that might be felt as to the probable effects upon its circulation and advertising. He also believed that members of the editorial staff who were in constant touch with developments in the railway and other fields covered by our papers should be better qualified than himself or anybody else to decide what should be published and what policies advocated or criticized in the editorial columns, and while he often raised questions as to the soundness of the editorial policies followed, he never once failed unflinchingly to support his editorial department when convinced that the editors themselves were satisfied as a result of adequate investigation and study that the policies they were following were sound from the standpoint of the interests of the industries the papers were undertaking to serve.

He fully recognized the fact that business papers could not serve their fields well without employing, developing and retaining capable men, who must travel extensively in order to gather material and maintain contacts with men of all ranks and classes in the fields served. To do these things required relatively more expenditures by the editorial department than most publishers will authorize. Colonel Simmons never failed to authorize and never criticized any expenditure that he was convinced was necessary to enable our papers, editorially, to render the best and the most service to their fields that was at all compatible with their earning capacity.

During periods of business depression, and especially during the present one, it became necessary for our company, like other business concerns, to retrench, and sometimes, and especially within the last year, to retrench very severely. During these trying times, however, and as recently as at the meeting of our board of directors last week, he stood fast for the principle that our papers must serve their fields as well as possible and that no curtailments of editorial expenses should be made which would impair the editorial quality of our papers if it could possibly be avoided.

If the various Simmons-Boardman papers have been outstanding in the services they have rendered to the business fields that they have undertaken to cover, the credit has been mainly due to Colonel Simmons' courage and public spirit as a publisher. If he had any characteristic which overshadowed these, it was his unfailing kindness to those, whether members of his organization or not, who for any reason became in need of assistance. He regarded it as the duty of the company and his personal duty to be not only just but liberal to those who had rendered long service to the company, and his generosity in dealing with those who applied to him for his assistance in their time of need will never be forgotten by any of those who were long associated with him.

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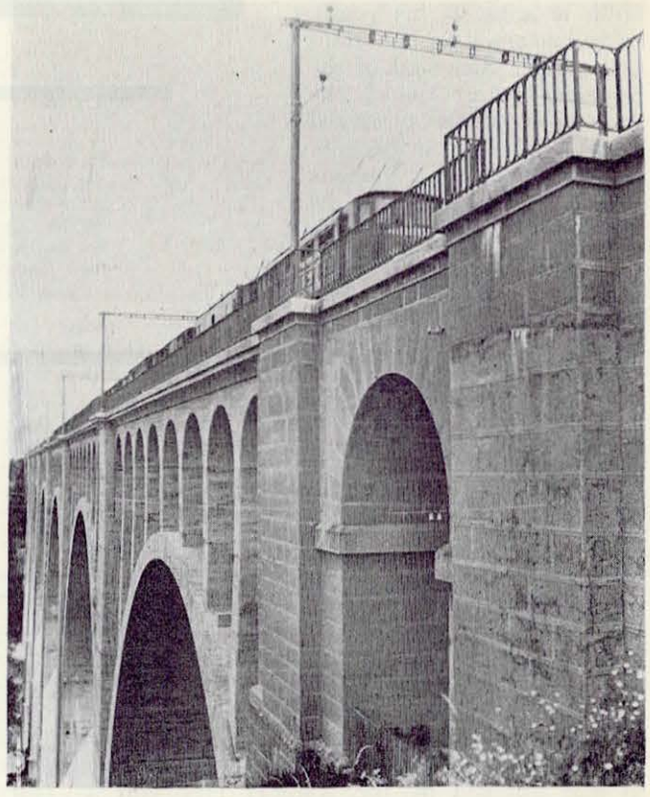


A Close View of a Swiss Federal Railway Train Crossing the Grandfey Viaduct at Fribourg

Test Train Hauled by Locomotive Equipped with Mays Front End

Illinois Central Effects Economies With Improved Front End

Tests of new design show notable reduction in locomotive back pressure and 12 per cent saviing in unit fuel consumption

A NEW locomotive front-end design, which combines essentially a Goodfellow exhaust tip and basket-bridge arrangement, with a continuous petticoat-pipe extension from the smoke stack to a short distance above the exhaust nozzle, has been developed and tested with notable success on the Illinois Central. This non-patented design is the result of nearly two years of experiment and study by the Illinois Central mechanical department under the personal direction of the general superintendent of motive power, F. R. Mays, after whom the front end has been named.

Comparative test runs in passenger-train service, using a Mountain-type locomotive of 51,121 lb. tractive force, equipped with the Mays front end, showed that it was possible to increase the exhaust nozzle diameter on this locomotive from 6⅜ in. to 7⅜ in., reduce the maximum back pressure from about 18 lb. to approximately 8 lb., save 12.05 per cent per 100 passenger-car-miles in fuel and 5.1 per cent in water. Moreover, the substantially increased capacity permitted using Pacific-type locomotives of 40,758 lb. tractive force, for example, on heavy passenger runs, where Mountain-type locomotives of over 50,000 lb. tractive force were formerly required to maintain schedules. Many attendant economies were realized, as a result of which the Illinois Central felt justified in making the new front end standard. It is already applied to 937 locomotives out of a total of 1,761 programmed for its application.

Prior to 1931, Illinois Central locomotives had for many years been equipped with the same general design of front-end appliances, including exhaust nozzle with split bridge; draft or petticoat pipe, separated from the smoke stack to provide over draft; adjustable diaphragm plate, etc. With this front-end arrangement, it was necessary to make use of exhaust nozzles of comparatively small diameter to create sufficient draft to burn the fuel used, which in turn created excessive back pressures up to a maximum of 18 lb. under some conditions of speeds, cut-off, and load. Locomotive efficiency was thereby decreased and machinery wear increased. It also made firing more difficult on account of the irregular and excessive pull of the draft on the fire. Tests had been conducted from time to time to determine if this condition could be improved, but no definite conclusions were reached regarding what changes should be made to effect the desired results.

Beginning in the latter part of 1929, the various designs of locomotive front ends were re-studied and certain fundamental changes suggested in the arrangement hitherto standard on the Illinois Central. Service tests were conducted with locomotives equipped first with the standard front end and later with the new Mays front end. As the tests progressed, changes in the adjustment of front-end appliances were made from time to time until it was definitely ascertained what arrangement provided a draft which burned the best fire with the least back pressure and lowest fuel consumption, and produced the greatest efficiency of the locomotive.

Details of the New Front-End Arrangement

Referring to the drawing the general arrangement of the design which produced the best results is shown. As stated, the exhaust nozzle diameter was increased from 6⅜ in. to 7⅜ in. in the case of Mountain type locomotives, such as the I. C. 2400 class. It will be observed that the upper end of the petticoat pipe fits closely in the smoke stack, and overhead draft is thus dispensed with entirely. The lower flared end of the petticoat pipe is 30 in. in diameter and extends to within 13½ in. of the table plate. The most outstanding

change called for by the Mays front-end arrangement is in the exhaust-nozzle bridge. The old split bridge, used for many years, was for the purpose of splitting the exhaust steam into two parts to fill the stack and thus create sufficient draft. The Goodfellow exhaust tip and basket-bridge arrangement has been shown to break up the steam jet more thoroughly by splitting it into four parts, thus completely filling the stack and, by a more effective entrainment of the gases with the steam jet, creating an equal and more uniform draft with a substantially larger nozzle opening and greatly reduced back pressure. The bridge itself is made of two crossed bars of ½-in. round case-hardened steel, set at 45 deg. to the locomotive center lines. The adjustable diaphragm or baffle plate in front of the exhaust pipe has been removed and a clear opening of 20¼ in. measured vertically is maintained on this class of locomotive.

Particular attention was paid to conditioning the locomotives in advance of the tests. The exhaust pipe and nozzle were lined up carefully with the center line of the stack, the seat of the nozzle on the exhaust pipe and the seat of the exhaust pipe on the cylinder saddle being checked for tightness by a water test. Also all superheater units, flues and the front end were similarly checked for leaks. The mechanical condition of locomotives as regards cylinder- and valve-packing wear, valve setting, etc., was carefully checked and brought up to standard. The brick arch, bearing directly against the flue sheet, was examined to assure its being in good condition.

Service Tests on Mountain-Type Locomotive

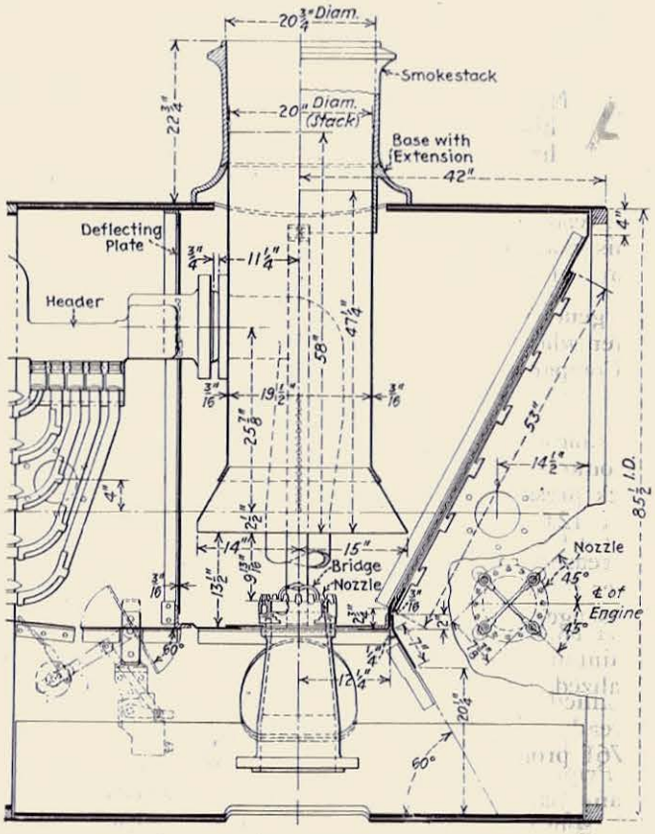
During April and May, 1931, a series of comparative service tests of front ends was conducted, using Illinois Central Locomotive 2447 in regular passenger train service between Memphis, Tenn., and Canton, Miss., a distance of 187 miles. This territory was chosen because of the uniform temperature and wind conditions and generally favorable grades which are a maximum of 1.22 per cent northbound and 1.25 per cent southbound. The capacity of the locomotive tender was 18 tons of coal and 10,000 gal. of water. Track scales were available at both initial terminals for weighing the tender in determining the amount of coal used. With the tender capacity stated, it was unnecessary to take coal enroute. With a tank capacity of 10,000 gal. water was taken only once enroute. The same locomotive crew was used during all tests.

The fuel consisted of Kentucky coal of relatively high B.t.u. content, special precautions being taken to assure uniformity. This coal was all received from one vein of the Graham mine, Kentucky, being loaded in four cars and kept protected from the weather. An analysis of the coal in the four cars showed its general uniformity, with heat content varying from 12,310 to 13,500 B.t.u. as indicated in the table.

Comparative Tests of Illinois Central 4-8-2 Type Locomotive No. 2447, Equipped with Old and New Drafting Arrangements*

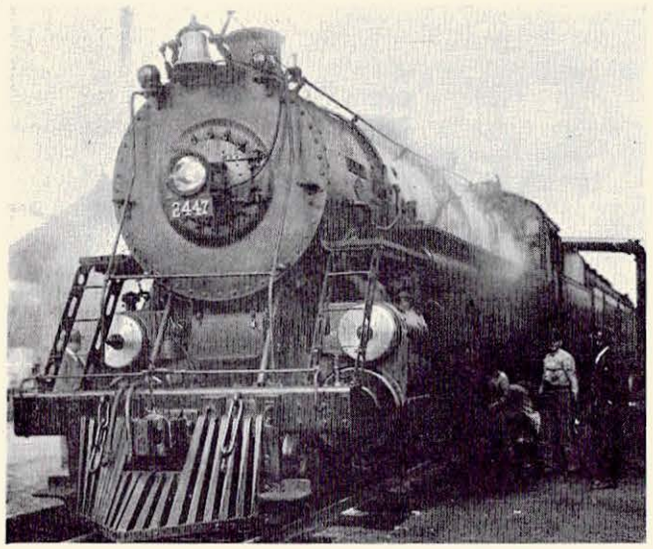
Trip Number	Number of cars	Car miles	Lb. of coal consumed per 100 p.c.m.	Lb. of water used per 100 p.c.m.	Lb. of water evaporated per lb. of coal	Running time Hr.	Running time Min.	Average running speed, m.p.h.	Depth of fire, in. Leaving	Depth of fire, in. Arriving	Condition of fire at end of trip
				SOUTHBOUND TRIPS							
1†	11	2,057	1,004	5,684	5.66	3	36	51.9	6	21	Bad
3†	{9 to Grenada 8 to Canton}	1,595	1,268	7,319	5.77	3	31	53.0	6	11	Fair
5†	8	1,496	1,338	7,133	5.33	3	40	50.9	6	21	Bad
Average	9.2	1,716	1,203	6,712	5.59	3	36	51.9	6	17.7	
7‡	8	1,496	1,180	6,856	5.81	3	36	51.9	5.5	9	Good
9‡	8	1,496	1,094	6,730	6.15	3	38	51.5	7	9	Good
11‡	8	1,496	1,035	6,444	6.22	3	43	50.3	5	9	Good
Average	8	1,496	1,103	6,677	6.06	3	39	51.2	5.8	9	
				NORTHBOUND TRIPS							
2†	8	1,496	1,221	6,986	5.72	3	41	50.8	5	20	Bad
4†	8	1,496	1,151	7,307	6.35	3	44	50.1	5	13	Fair
6†	8	1,496	1,066	6,933	6.50	3	41	50.8	6	13	Fair
Average	8	1,496	1,146	7,075	6.19	3	42	50.6	5.3	15.3	
8‡	8	1,496	986	6,265	6.35	3	41	50.8	6	9	Good
10‡	8	1,496	1,027	6,329	6.16	3	41	50.5	6	10	Good
12‡	7	1,309	1,077	6,970	6.47	3	42	50.5	7	8	Good
Average	7.7	1,434	1,030	6,521	6.33	3	41.6	50.6	6.3	9	

* Tests made on Panama Limited runs between Memphis, Tenn., and Canton, Miss., 187 miles, using Kentucky coal.
† Locomotive equipped with former drafting apparatus.
‡ Locomotive equipped with Mays drafting apparatus.



General Arrangement of Mays Locomotive Front End—Insert Shows Plan View of Exhaust Nozzle and Bridge

Coal was taken only at the initial terminal on a total of six northbound and six southbound trips. The locomotive tender was weighed on track scales at the initial and final terminals by removing a wedge from between the locomotive and tender so that it would be free. Identification marks on the track scales permitted spotting the tender in the same location each time the tender was weighed. Water taken at the initial terminal on each trip and again at Grenada, Miss., was measured by previous calibration of the tender in inches at the left front and right back corners.



Test Locomotive 2447 Taking Water Once En Route at Grenada, Miss.

The locomotive was equipped with a steam-chest and back-pressure gage in duplex form, mounted in the cab, readings being taken on passing each station other than where stops were made. The steam-chest gage pipe was tapped into the right steam pipe and the exhaust gage pipe into the exhaust space of the right valve chamber at each end by means of a branch connection. All gages were tested at the beginning of each test. The amount of superheat temperature was measured with the use of a standard pyrometer gage also tested at the beginning of each test. The depth of fire in the firebox was estimated by means of narrow steel strips welded to the firebox sides at distances of 6 in., 12 in. and 18 in. respectively above the grates.

Analysis of Kentucky Coal Used in Test Runs

	Car No. 401253	Car No. 400656	Car No. 400138	Car No. 127529
Moisture	.94	.95	1.19	1.18
Volatile combustible	35.27	39.30	37.26	38.52
Fixed carbon	48.45	52.43	50.35	50.15
Ash	15.34	7.32	11.20	10.15
Sulphur	3.49	3.52	4.90	3.49
B.t.u.	13,350	13,500	12,310	13,250

The results of these tests are summarized in the large table which shows a reduction in coal consumed per 100 passenger-car-miles from 1,203 lb. to 1,103 lb., or 8.3 per cent southbound and 1,146 lb. to 1,030 lb. or 10.1 per cent northbound. This is an average of 9.2 per cent saving in both directions, due to installation of the Mays front end. The saving, per 100 passenger-car-miles, placed on the basis of an equal number of cars, is 12.0 per cent southbound and 12.1 per cent northbound, or 12.05 per cent average saving in both directions. By a similar process of calculation the saving in pounds of water evaporated per pound of coal is found to be 5.1 per cent on the average in both directions. The fire was burned more uniformly and fewer cinders were thrown from the stack, a fact commented on by conductors.

The maximum back pressure observed in these tests with the locomotive operating at 40 per cent cut-off on grades was 8 lb., which may be compared with 18 lb. with the old standard front end. The maximum back pressure noted at any of the regular test observation points, however, was only 3½ lb., at which time the locomotive was operating at 60 m.p.h. and 30 per cent cut-off with a boiler pressure of 198 lb. and steam-chest pressure of 192 lb. This reduced back pressure, in addition to increasing the efficiency of the locomotive substantially, results in lower water consumption, reduced maintenance of machinery, and less back-pressure stresses.

The benefit which the Illinois Central derives from the adoption of the Mays front end may be better realized when saving in fuel is shown on a money basis. During the year 1930, locomotives on this system consumed 4,201,108 tons of coal at an average cost of $2.124 per ton, or a total cost of $8,926,333.64. Using the locomotive fuel consumption during 1930 as a basis, the Mays front end when applied to all locomotives promises to effect a saving in fuel alone of over one million dollars. When additional savings resulting from reduced wear on machinery, reduced water consumption and increased efficiency of locomotives is taken into account, the total savings may be estimated at one and one-half million dollars per year. The average cost per locomotive for changing the front ends is $25.

Dunn and Weaver Debate Waterways Developments

WIDELY divergent views on the development of inland waterways were expressed by former Governor A. J. Weaver of Nebraska and Samuel O. Dunn, editor of the *Railway Age*, in a debate on the question of the development of a national system of inland waterways, at Columbus, Neb. on September 16, in conjunction with the eighth annual Mid-Nebraskan Exposition, which is held each year to commemorate the formation of plans for starting a settlement in Nebraska. Mr. Weaver argued in favor of the development, while Mr. Dunn characterized such development as an unjustified experiment.

Mr. Weaver outlined six major reasons which, he claimed, justify the construction of inland waterways: 1. Transportation is so closely connected with the growth and prosperity of a nation that in every important country of the world the government owns or controls the railroad transportation service; 2. In every nation of the world waterways belong to the government and always remain under the control of the government for the benefit of the people; 3. The national policy, for 150 years, of the improvement of harbors, coastal and other rivers, the Great Lakes and connecting channels, establishes a precedent which justifies the completion of the system; 4. Under the ruling of the Interstate Commerce Commission and the Dennison act, river rates go inland and the public in every part of the United States receives the benefits of water transportation through joint rail and water rates; 5. The increase in taxable wealth which will come from

this development, the conservation of soil now destroyed along our great water courses by erosion, and especially in the Missouri valley, the national saving from that part of flood loss and damage traceable to inadequate and unregulated channels, each alone would justify the improvement; 6. Every government, from the nation to the smallest subdivision, is entitled to the cheapest public utility service available.

Mr. Dunn charged that no large expenditure of the taxpayers' money could be more economically unjustifiable and wasteful under present conditions than the proposed large expenditures upon the development of rivers and canals. The important question, he said, is not the effect that will be produced upon the railways, although that should be considered, but the effect upon the public welfare. He opposed large expenditures upon rivers and canals because they will increase taxes and will not cheapen transportation, but on the contrary, will actually increase the total cost of transportation and, therefore, will be in every respect detrimental to the public interest. He maintained that the real value of inland waterways has been tested for years and that the tests made demonstrate beyond any reasonable doubt that proposed future expenditures, not only on the upper Mississippi and the Missouri river, but in other parts of the country will not be justified by the results.

Estimates of Cost and Traffic Worthless

"Most past estimates of the cost of projected inland waterway improvements and of the traffic that would be handled have been almost worthless, and present estimates cannot be relied upon," he said. "In 1901, the State of New York provided $101,000,000 which it was estimated would cover the enlargement and deepening of its barge canal system. To June 30, 1929, its cost of construction had been $176,000,000, and operating, maintenance and interest costs had increased this total to $273,000,000. In 1901, it was estimated that the traffic handled would amount to 20,000,000 tons annually, but it has exceeded 3,000,000 tons in only one year. The average railway rate per ton-mile in that territory is 10 mills, while the total cost on the barge canal is 19.4 mills, of which the shippers pay 4½ mills in rates and the public 15 mills in taxes.

"In 1915, the cost of 37 locks in the Ohio river was estimated by the board of army engineers at $50,000,000, but up to June 30, 1930, they had cost $88,000,000 and the total cost of the Ohio river system, including the Ohio, the Allegheny and the Monongahela rivers, has exceeded $250,000,000. The average rate per ton per mile of the railways in the Ohio river territory is less than 9 mills, while the average cost of carrying a ton of freight 1 mile on the Ohio system in 1928 was 12.4 mills, of which the shipper paid about 6 mills in rates and the public paid about 6½ mills in taxes.

"The development of inland waterways on which freight is handled at low rates, because most of the cost of transportation on them is paid by the taxpayers, cannot fail to injure the railways, which already are suffering severely because of the diversion of traffic from them to government subsidized and unregulated carriers by water and highway. This diversion of traffic tends to make it necessary for the railways to charge higher rates, and in fact, is one of the principal reasons why they are finding it necessary now to seek an advance in rates. Railway lines reach into every community, while waterways can reach only a comparatively small number of communities and, therefore, by developing waterways, the government helps to place at a disadvantage all shippers and communities that are not located on the waterways, although those that are not located on them are taxed to help pay for their development.

"The huge burden of taxation, now amounting to about $13,000,000,000 a year, which has been loaded upon the backs of the American people by reckless extravagance in government, has probably been the principal cause of the coming, prolongation and deepening of the present depression, which is the worst ever known. Those who advocate increases in the present enormous government expenditures to promote competition, at a time like this, with railroads and other enterprises in which private capital is invested, and which give large employment to labor, should be required to advance better arguments for these expenditures than mere claims of which all the tests afforded by past and present experience are a refutation."

Treasury Officers Meet

THE twenty-fifth annual meeting of the Railway Treasury Officers Association was held at Hotel Statler, Buffalo, N. Y., on September 17-18. Reports of standing and special committees were discussed. Revised rules governing the collection of transportation charges have been formulated as the result of a hearing before the Interstate Commerce Commission and its subsequent order. The question of settlement of interline balances and accounts has been the subject of discussion with the Railway Accounting Officers Association, but it was considered inopportune at the present time to attempt to advance the matter. The Committee on Uniform Shippers' Order Bonds presented a final report embodying specimen bond forms of single shipment and blanket types, to be filed with railways for delivery or other disposition of order consignments prior to surrender of the original bill of lading, or of shipment under a straight bill of lading without surrender of proper order to deliver.

The rules for the issuance, conduct and disposition of bills of lading have been approved by the Railway Accounting Officers Association in so far as they pertain to accounting matters. The Freight Claim Prevention Committee of the American Railway Association has recommended these rules to member roads for consideration and adoption. The Committee on Uniform Instructions to Agents Covering Acceptance of Travelers' Checks presented a set of rules together with recommended forms of indemnity agreements to be made with travel check companies. A paper was presented on the subject of calendar simplification, following which a resolution was adopted expressing the sentiment of the association that it is unnecessary and inexpedient to make any change in the present calendar.

The new officers are P. D. Houston, treasurer, Tennessee Central, president; I. W. Booth, secretary and assistant treasurer, Norfolk & Western, vice-president, and L. W. Cox, secretary and treasurer (re-elected).

A TRAIN OF 70 CARS of sugar pine lumber was started from Pinedale, Cal., over the Southern Pacific on September 21, with cars for Nebraska, Iowa, Illinois, Missouri, Michigan, Ohio, Pennsylvania, Maryland, New York, Rhode Island, Massachusetts, Connecticut and points in Canada.

Hearings on Railroad Practices

Sessions under Part 2 of Ex Parte 104 closed at New York on September 29—To resume at Pittsburgh October 5

NEW YORK hearings in connection with the Interstate Commerce Commission's investigation of railway practices affecting operating revenues and expenses (Ex Parte 104, Part 2) were concluded on September 29, after the sessions had extended over seven hearing days in that city. W. P. Bartel, director of the I. C. C. bureau of service, who is presiding, announced an adjournment to October 5 at Pittsburgh, Pa., where the schedule calls for hearings from that date until October 17.

In addition to the testimony of Delaware & Hudson and Delaware, Lackawanna & Western witnesses, reported in the *Railway Age* of September 26, evidence was presented at the New York hearings by the following railroads: The Erie (Eastern district); the Lehigh & New England; the Lehigh Valley; the New York Central (Lines Buffalo, Clearfield and East); the New York, Ontario & Western; the Ulster & Delaware; the Lehigh & Hudson River; the Central of New Jersey; the Reading; and the Staten Island Rapid Transit.

As each of the carriers responding at New York completed its presentation A. G. Hagerty, attorney for the Commission, asked that a statement be filed showing for a period of one year the total money paid out of revenues for allowances to industries, switching charge absorptions and other terminal services. Objection was raised by railroad counsel because of the work involved and also because they held that such a statement would show only one side of a picture—it would not reveal the savings in spotting costs which allowances to industries effect nor the additional revenues which switching absorptions bring about. After a conference with accounting officers on the matter Director Bartel deferred to a later date a formal ruling on Attorney Hagerty's request.

Erie

M. B. Pierce, assistant general counsel of the Erie in his opening statement on September 24, said that at the New York hearings he would present evidence relating to the Eastern district of the Erie, the New York, Susquehanna & Western and the New Jersey & New York. Testimony with reference to other Erie lines will be introduced at the Pittsburgh, Pa., and Chicago sessions. J. F. Ingling, supervisor of fuel and locomotive operation and former assistant to the general manager, was the first Erie witness. Mr. Ingling's testimony dealt with the operating aspects of delivering carload freight in the territory east of Port Jervis, N. Y. He stated that there are no plants in this territory which receive allowances from the Erie for performing spotting services. Some industries with systems of plant tracks on these lines do, however, perform spotting without any allowance while at others the Erie motive power does all the spotting. Mr. Ingling described the switching moves involved in serving a typical industry in each of the two forementioned classes.

Under cross-examination, Mr. Ingling stated that spotting time per car was probably greater on single spur tracks than at plants with several tracks because of the volume of traffic usually handled in the latter instances. He thought, however, that if the Erie had adequate team track facilities it would probably be cheaper to serve all patrons on these.

W. A. Cotton, mechanical assistant, followed Mr. Ingling and introduced an exhibit showing the approximate cost per switching locomotive hour on the Erie System. The figure of $6.92 per hour shown in this exhibit, Mr. Cotton explained, included in the main out of pocket costs. J. W. Graves, superintendent at Dunmore, Pa., accepted for the Erie the description, previously introduced by the Delaware & Hudson, of the operations involved in serving the anthracite coal fields.

H. R. Adams, assistant general manager of the Eastern district, supplemented Mr. Ingling's testimony with descriptions of Erie operations at plants west of Port Jervis. Mr. Adam's testimony revealed that the Erie makes to certain iron and steel plants allowances similar to those mentioned in connection with the Delaware, Lackawanna & Western presentation, reported in the *Railway Age* of September 26. Director Bartel brought out that some of these allowances are paid to plants not located on Erie rails but reached only through another line, the switching charges of which the Erie absorbs.

T. P. Hennessy, chief clerk in charge of demurrage, followed Mr. Adams and explained the rules under which the Erie assesses demurrage in specific cases about which Director Bartel inquired. In the course of his testimony Mr. Hennessy was led to the same admission as was General Freight Agent Williams of the D. L. & W. with reference to cases where allowances are made for switching and the free time under the demurrage tariffs is computed from the first 7 a. m. after the cars are placed on the interchange track. He, like Mr. Williams, conceded that in such cases the carrier would seem to be applying the demurrage tariff while the car is still in transit to final destination.

Allowances Dictated by Competition

The final Erie witness—O. M. Meyne, assistant general freight agent,—first cited for the record all Erie tariffs covering diversion, reconsignment, absorptions, allowances and accessorial services. The road employs the general reconsignment and diversion tariffs and makes the usual competitive absorption of connecting line switching charges. Allowances to the iron and steel plants served by the Erie are on the same basis as those granted by the D. L. & W. In subsequent cross-examination Mr. Meyne agreed that in the main these allowances were dictated by commercial and rail competition. Erie tariffs on iron and steel products, it was also developed, provide for fabrication in transit; the charge for this is three cents per 100 lb.

Director Bartel's examination of Mr. Meyne was an attempt to determine what it costs the Erie to get the traffic of iron and steel plants which it reaches only by absorbing the switching charges of a connecting line. The cost of obtaining such traffic, the Director said, was the amount of the allowance to the plant plus the amount of the connecting line switching charge absorbed plus the switching line's reclaim on per diem.

The witness agreed to furnish a statement showing the above disbursements at some selected plant on a per car basis and revealing in addition the revenue per car on some representative commodity moving in considerable volume to the plant.

Lehigh & New England

The Lehigh & New England presented three witnesses —W. H. Edwards, general superintendent; J. R. Brown, superintendent of car service, and C. F. Keller, general freight agent. Mr. Edwards stated that the principal commodities handled by the L. & N. E. are anthracite coal and cement. No industries, he continued, receive allowances for performing their own spotting service; there are five plants on the L. & N. E. which perform their own switching without allowances and eleven plants served by two or more tracks on which the L. & N. E. does the spotting. This road performs no loading or unloading of carload freight; neither does it have any elevator or storage facilities. Crane facilities are provided at some points where no charge is made for their use. After giving examples of typical switching services at cement plants Mr. Edwards accepted for the L. & N. E. the Delaware & Hudson description of services at anthracite coal mines. Mr. Brown's testimony related to demurrage while Mr. Kellar gave references to L. & N. E. tariffs covering rate relationships with connecting industrial railroads.

Lehigh Valley

J. N. Haines, general manager, was the first Lehigh Valley witness. His opening statement embraced a brief description of the switching services performed at each of several industries about which the I. C. C. had inquired. The Lehigh Valley also makes allowances to certain iron and steel plants which perform their own spotting services. The only reason for these allowances, Mr. Haines insisted under cross-examination, was the fact that the allowance is in each instance less than would be the cost to the Lehigh Valley of performing the spotting services involved. The Lehigh Valley, he continued, considers its obligation under the line haul rate to be one of spotting cars at convenient points for loading and unloading. If an industry desires to do its own switching and asks an allowance an investigation is made, he said, and if the allowance desired is less than the carrier's cost of doing the spotting then the allowance is made. Asked why industries can do the spotting work more economically, Mr. Haines said that generally industrial locomotives are small, their operators do not receive standard wages nor are the plants required to observe hours of service rules and other regulations which tend to augment railroad operating expenses. While he agreed that competition dictated the absorption of connecting line switching charges, the witness held that operating considerations were the controlling factor in the granting of allowances.

In his subsequent cross-examination of the Lehigh Valley traffic witness—I. S. Auch, general freight agent —on the foregoing subject Attorney Hagerty brought out that the traffic department determines the plants to which allowances will be granted. In re-direct examination by Lehigh Valley counsel, however, Mr. Auch agreed that the traffic department alone does not in all cases determine the matter of allowances; he knew of cases where the operating department had asked to be relieved of costly switching through the granting of allowances.

Director Bartel, in his questioning of Mr. Haines, was interested in developing under what theory an allowance is granted to an industry with which the Lehigh Valley has no physical connection. The witness stated that presumably the Lehigh could reach such plants under trackage rights over the lines which it now employs to do the switching. The director then asked from Mr. Haines the same statement that he had requested of the Erie, relating to the several deductions from line-haul revenue involved in reaching the plants under discussion. This witness would not, however, concede to Director Bartel, as did Mr. Willaims of the D. L. & W. and Mr. Hennessy of the Erie, that demurrage and line-haul tariffs are operating concurrently in cases where allowances are granted and demurrage is computed from the time of placement on the interchange track. Mr. Haines thought previous discussions on this matter had confused demurrage with operating practice. In effect he gripped the two horns of the dilemma and swung himself to an unassailable position between, for he coined a new word to fit the circumstances; he said that cars placed on the interchange tracks at plants receiving allowances were placed only "demurragely." Mr. Haines told Attorney Hagerty that he attached no special significance to the fact that the spotting allowances are confined in the main to plants of the iron and steel industry.

General Freight Agent Auch in his direct testimony cited for the record the Lehigh Valley tariffs covering accessorial services, allowances and absorptions. This road follows the uniform storage, reconsignment and diversion charges. It publishes a charge for loading and unloading carload freight at Buffalo and another, effective at Easton, Pa., which covers the unloading of mail shipped in freight service and consigned to the post office at Easton. Mr. Auch was subjected to but little cross-examination in addition to that under which his testimony on allowances referred to above, was developed. He conceded that competition forced the Lehigh Valley to absorb switching charges; this must be done, he said, in lieu of providing its own terminal if the business is desired.

At the opening of the September 26 session Director Bartel stated that he gathered, from the evidence which cross-examination of railway witnesses by industrial counsel was developing, that there was a disposition among these counsel to think that the investigation contemplated establishing a distinction between spotting on a public team track and on an ordinary private siding. As for himself, the Director said he certainly would not recommend a charge in addition to the line-haul rate for delivery on an ordinary private spur. The distinction in service, if any, he continued, is between the ordinary private siding and the complicated system of industrial tracks requiring spotting at several different points within a plant.

New York Central

New York Central testimony presented at New York related to its lines east of Buffalo and Clearfield; Ira H. Hubbel, assistant traffic manager, was the first witness. Mr. Hubbel, like other traffic witnesses, made a general statement refering to the tariffs covering matters under investigation. He stated that reconsignment of fruit and vegetable traffic at Buffalo is an exception and is performed without a charge. He assigned carrier competition as the reason for this exception, stating that the New York Central followed other carriers in the matter. The New York Central makes allowances to iron and steel plants as do the other carriers whose witnesses have been reported previously on the subject.

Director Bartel questioned Mr. Hubbel as to the service contemplated in New York Central switching tariffs under which service is performed for other roads to plants which are given an allowance by those

other roads. Mr. Hubbel conceded that since the New York Central switching tariffs apply to and from private sidings they presumbably include spotting at plants. The Director took as an example a plant to which the Lehigh Valley grants an allowance but which the Lehigh reaches only by absorbing a New York Central switching charge. In such a case, he asked, is the Lehigh Valley paying for the spotting twice—once when it absorbs the switching charge which presumably contemplates spotting and a second time when it grants the allowance to the plant? The witness did not express any opinion and the Director did not press the point further.

In explaining to Attorney Hagerty the New York Central absorption tariffs, Mr. Hubbel stated that these are not confined to competitive traffic; the only limitations are minimum tonnage and revenue requirements. It is the desire of the New York Central to give its patrons the widest possible range of markets, the witness added.

"Is it or is it not a fact", asked Director Bartel, "that the traffic department is after business regardless of cost?"

"That's a pretty broad statement, Mr. Director," said Mr. Hubbel.

"Well, isn't it a fact?" Director Bartel insisted.

"I can't go that far" the witness said and added, "We hate to see anything get away—I'll say that."

Bulk Container Services

Asked by Attorney Hagerty about New York Central container services on cement traffic, Mr. Hubbel stated that he was not prepared to testify on container services. Thomas P. Healy, Washington, D. C., attorney representing the New York Central, stated that he had not intended to present evidence on containers in view of the fact that the I. C. C. had recently passed on merchandise container services and because bulk container traffic was mainly intrastate. Director Bartel stated he would like some information on the bulk container. It was his understanding, he said, that the New York Central publishes a rate for cement moved in box cars and the same rate for that commodity handled in containers, the latter, however, including unloading at destination. When Mr. Healy insisted that the greater proportion of this container traffic is intrastate the Director asked counsel if he would state for the record that the New York Central container tariffs on bulk commodities contemplate unloading. Mr. Healy conceded that the New York Central provides crane facilities for this traffic and that the crane service provided permits of a dropping of the loaded container onto a motor truck or a suspension of the container over a truck to permit an emptying of the container contents into a truck by means of a drop bottom device on the container.

Director Bartel pressed the point further, however, and said he had heard of instances where the New York Central maintains a locomotive for spotting container cars convenient to crane facilities. Also, the Director was informed, there were instances where the New York Central had leased land adjacent to its crane facilities to road building contractors who received container shipments of cement. In some such cases, he continued, he understood the contractor's bins are located so that the New York Central crane is able to move the containers from the cars to a point where their contents may be dropped directly into those bins. The Director's further understanding, as he stated it, is that this whole subject was brought before the trunk line traffic managers and voted down, notwithstanding which the New York Central proceeded with the plan.

Further questioning of Mr. Hubbel related to coal storage charges at Buffalo and he then relinquished the witness chair to D. B. Fleming, assistant general manager, New York Central, Lines Buffalo and East.

Mr. Fleming's opening statement embraced a brief description of switching operations at 54 locations, mentioned in the notice received by the New York Central. Cross-examination of this witness by Attorney Hagerty related in the main to the performance of spotting services at different types of plant layouts, while Director Bartel was interested in facilities and charges for the handling and storage of coal on docks at Buffalo.

Container Services Explained

When New York Central counsel called no witness to follow Mr. Fleming, Attorney Hagerty expressed a desire to have testimony regarding container shipments of cement such as Director Bartel had previously mentioned, as reported in the foregoing. Mr. Healy repeated his statement to the effect that he had prepared nothing on container service. The Director's statement of September 26, on the subject, Mr. Healy continued, seems to indicate that the Director is fully advised as to the facts and in addition seems to infer that there is some reprehensible practice involved in the bulk container services. Asked by Director Bartel if he would admit for the record that there was something reprehensible about the service Mr. Healy replied with an emphatic negative. In view of the Director's statement, however, Mr. Healy said he would not produce a container witness voluntarily—he took the position that under the circumstances if a container witness were desired a subpoena should be issued. Accordingly, a subpoena was served on J. N. Crocker, manager of mail, express and container traffic, who was present in the hearing room. Before permitting the examination of Mr. Crocker by Attorney Hagerty, Mr. Healy required that the record show his objections to any questions relating to intrastate traffic moving in containers.

Mr. Crocker then proceeded to read a statement describing in detail the container service for bulk commodities afforded by the New York Central to road-building contractors. The commodities involved, the witness said, are crushed stone, cement and sand, all three of which are susceptible to handling by competing motor trucks and barge lines. When a road construction job is advertised the New York Central consults with some prospective bidder and outlines for him the service it will provide if the materials are handled in container service. On the basis of this information the contractor submits his bid. Out of 13 jobs so calculated this year the New York Central was successful in getting the traffic of all three commodities (cement, sand and stone) in only one case. In August, 1931, its gross revenue from the handling of sand, stone and cement in containers was $67,289.81.

As to the attitude of the Trunk Line Association, characterized by Director Bartel as disapproving, Mr. Crocker said that this organization has never objected to the transfer by the New York Central crane of the loaded container to a truck; the objection, the witness said, was directed to the suspending of the container to permit a dumping of its contents into trucks or bins. This attitude, Mr. Crocker called "a distinction without a difference." There is some misunderstanding, Mr. Crocker continued, if an impression is abroad that the New York Central is going ahead with the bulk container service in the face of the Trunk Line Association's disapproval. At one meeting, he explained, the Trunk Line Association by a majority vote did object to the dumping of the contents while the container was

suspended on the New York Central crane. But the New York Central pointed out that it had already agreed with road contractors to perform the service and these contractors had made bids for road jobs with this container service entering their calculations. Thus the railroad felt a moral obligation to provide the service. It was therefore agreed that the tariffs providing for the dumping of the container contents would have an expiration date of December 31, 1931, in order not to interfere with highway construction work already planned. Thus, the witness said, the bulk cement is now being handled under tariffs approved by the Trunk Line Association.

Container Plan an Experiment

Director Bartel, in his statement of September 26, opening this container subject, had said he was informed that the New York Central provided a locomotive to spot container cars for the crane. Mr. Crocker said that this was done only at one point, that it was not contemplated when the traffic was solicited and was resorted to only because the contractor at that point required the materials very rapidly. The witness continued to outline the operations involved in serving the road contracts under the bulk container tariffs. The plan this year, he said, is a pioneering one; the New York Central thinks the container is the only weapon which permits it to meet truck and barge competition for this traffic. It was the disposition of the New York Central, Mr. Crocker added, to seek the sympathy of the Interstate Commerce Commission in this matter for the railroad thinks it is doing the right thing. Whereupon Attorney Hagerty required the record to show that his questions were in no way calculated to develop the existence of any reprehensible practice; the bulk container, he added, is a new type of service and he was merely attempting to show its affect on the revenues and expenses of the railroad.

Director Bartel's questioning of Mr. Crocker brought out the fact that one contractor's bins were located on land leased from the New York Central. The witness did not know the details of the lease. Further questions by the Director related to ownership of containers and container cars and to terms on which railroads other than the New York Central could obtain the use of this equipment. To answer these latter New York Central counsel stipulated for the present record testimony on these matters presented in the recent container service investigation.

Following the New York Central there came in turn the New York, Ontario & Western, the Ulster & Delaware and the Lehigh & Hudson River. Each presented an operating and a traffic witness and the presentations of all three roads consumed less than an hour. Their switching operations are confined in the main to ordinary spur track spotting while their accessorial services are few. None of the witnesses for these roads was subjected to any extended cross-examination by counsel for the commission.

Central of New Jersey

The Central of New Jersey presented the testimony of R. W. Brown, vice-president and general manager, and of C. L. Ewing, freight traffic manager. Three plants on the Jersey Central, Mr. Brown testified, receive allowances for performing their own spotting services; two are steel plants and the other is the plant of the Standard Oil Company of New Jersey at Bayonne, N. J. Eighteen plants with systems of tracks perform their own spotting without any allowances. Mr. Brown did not know the reasons for the allowances —the determination of these matters, he testified under cross-examination, rests with the traffic department.

Mr. Ewing first filed an exhibit listing reference numbers to 100 Jersey Central tariffs covering accessorial services which he said were generally the same as those of other railroads. In his examination of Mr. Ewing, Director Bartel was interested in the interchange with the Chestnut Ridge Railway, serving among others the plant of its owner the New Jersey Zinc Company, near Palmerton, Pa. The witness stated that he understood the acquisition of the Chestnut Ridge by the New Jersey Zinc Company was in the interests of more efficient operation of the Zinc Company's plant. The Director's further questioning brought out that both the C. N. J. and the Chestnut Ridge serve directly what is known as the New Jersey Zinc Company's West plant. The traffic for this plant is, however, now routed over the Chestnut Ridge. The Director next asked if the C. N. J., unless it so desired, could be forced to enter joint rates short-hauling itself by means of this interchange with the Chestnut Ridge. The witness said that the rates were established in accordance with a decision of the I. C. C. The Chestnut Ridge, he later testified, receives a division of $4.95 cents per car on carload freight handled by it.

In the course of his discussion of allowances to plants for spotting Mr. Ewing mentioned the fact that the Standard Oil Company of New Jersey was seeking to have the railroads perform the switching of its Bayonne, N. J., plant in lieu of doing the switching itself under the allowance plan. Mr. Ewing was next asked why the railroads—the Lehigh Valley and Jersey Central both serve this plant and now make an allowance to it —have not acceded to the Standard Oil request if they conceive it to be the carrier's duty to spot cars at plants now receiving allowances. The witness stated that negotiations were as yet pending but the Director could not see the need for negotiations if the duty of the carriers to perform the spotting under the line-haul rates was not in doubt. If the final decision be that the railroads will not perform the service, the Director asked, would the allowance be continued? Mr. Ewing said it would not be continued if a study indicated that conditions had changed so that the carriers, once physically able to do the spotting, could not now do so because of some disability of the plant.

Mr. Ewing next testified that the C. N. J. has in service what he called "steel crate containers, an invention of the Jersey Central," designed to meet highway competition for brick and building-block traffic. Tariffs under which shipments in these containers move provide for the transfer by crane of the container from car to truck at destination points where crane service is available.

Reading

With the exception of the brief presentation of the Staten Island Rapid Transit, consuming the final half-hour of the New York hearings, the Reading was the last road to be heard in that city. A. T. Owen, superintendent of transportation, and W. B. Gheen, assistant freight traffic manager, appeared. Mr. Owen proceeded first to describe various types of switching services and revealed that certain iron and steel plants receive from the Reading allowances for performing their own spotting. Mr. Owen did not know the reasons for these allowances. The greater part of the examination of Mr. Gheen related to the question of whether the switching line or the line-haul carrier is obligated to spot cars at industries receiving allowances. Director Bartel was seeking the reason why, if the tariffs of the switch-

ing carrier whose charges are absorbed contemplated spotting, the allowance to an industry served under such a set-up is paid by the line-haul road. The witness agreed that the switching road is benefited under such a plan because it is relieved of spotting services contemplated in its tariffs. He added, however, that reciprocal switching arrangements are mutually advantageous to railroads and usually equalize themselves.

Multi-Pressure 3-Cylinder Locomotive for N. Y. C.

DURING the celebration at Schenectady, N. Y., on September 24, of the one hundredth anniversary of the DeWitt Clinton, the first locomotive to run in the State of New York, officers of the New York Central Lines and the American Locomotive Company inspected the experimental multi-pressure locomotive which has just been completed for the railroad at the Schenectady works of the American Locomotive Company.

This locomotive, the order for which was placed in the spring of 1929, employs the same system of steam generation and utilization as the Schmidt-Henschel double-pressure high-pressure locomotive * built in Germany in 1925, which is now known in America as the Elesco multi-pressure system. The principle of this system consists of the utilization of steam from a two-pressure boiler in which the high-pressure portion receives its heat indirectly through the medium of a closed-cycle steam generator, the tubes of which constitute the firebox portion of the boiler and are directly exposed to the radiant heat. A steam pressure up to 1,300 lb. is developed in the closed cycle, which is filled with distilled water. This steam passing through coils in the high-pressure drum transfers its heat to the water in this drum, in which steam is generated at a pressure of 850 lb. per sq. in. The drum itself is not exposed to radiant heat.

The high-pressure steam is superheated and is used in a single high-pressure cylinder. The exhaust from this cylinder, augmented by superheated steam from the fire-tube or low-pressure portion of the boiler at 250 lb. per sq. in., supplies the two low-pressure cylinders.

The New York Central locomotive is of the 4-8-4 type and the total weight of the engine and tender is 747,700 lb. It develops a tractive force of 78,500 lb.

The locomotive was designed jointly by the railroad, the Superheater Company and the American Locomotive Company.

* For a description of this locomotive see page 1969, June 26, 1926, *Railway Age*.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended September 19 amounted to 742,628 cars, which was less than the loading in the week before Labor Day and 209,933 cars less than the total for the corresponding week of last year. As compared with 1929 it was a reduction of 424,767 cars. Loading of miscellaneous freight was 106,582 cars less than that for the corresponding week of last year, while merchandise loading showed a decrease of 26,888 cars and coal loading a decrease of 30,862 cars. All districts showed decreases from last year. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, September 19, 1931

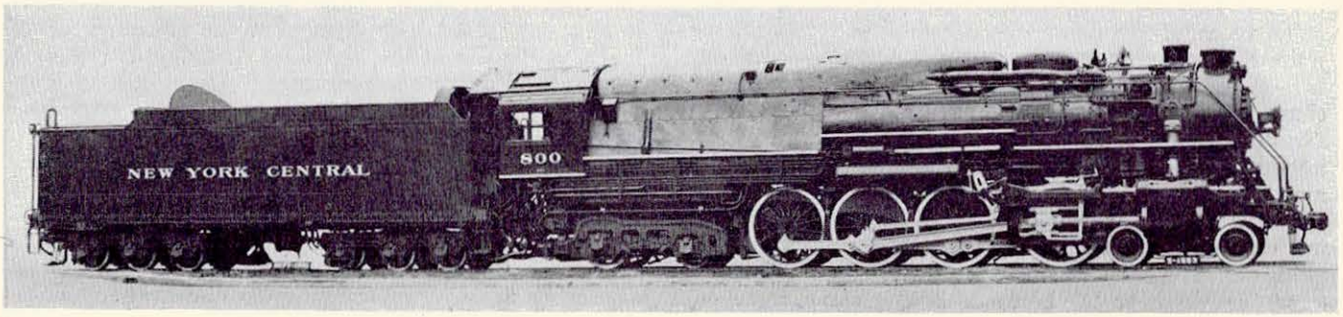
Districts	1931	1930	1929
Eastern	164,981	210,636	261,547
Allegheny	143,369	188,381	235,947
Pocahontas	48,153	55,661	64,045
Southern	103,175	129,819	157,256
Northwestern	105,387	144,545	182,532
Central Western	116,067	144,619	169,879
Southwestern	61,496	78,900	96,189
Total Western Districts	282,950	368,064	448,600
Total All Roads	742,628	952,561	1,167,395
Commodities			
Grain and Grain Products	40,192	46,125	51,775
Live Stock	24,931	27,175	32,135
Coal	123,005	153,867	192,781
Coke	4,606	8,176	11,975
Forest Products	26,572	41,496	62,576
Ore	29,855	48,785	68,956
Mdse. L.C.L.	217,912	244,800	271,407
Miscellaneous	275,555	382,137	475,790
September 19	742,628	952,561	1,167,395
September 12	667,750	965,813	1,153,274
September 5	759,546	856,649	1,018,481
August 29	763,764	984,510	1,162,100
August 22	748,711	940,558	1,137,966
Cumulative total, 38 weeks	27,827,959	34,203,038	38,716,887

The freight car surplus for the week ended September 14 averaged 571,014 cars, an increase of 5,905 cars as compared with the preceding week. The total included 300,097 box cars, 206,469 coal cars, 25,306 stock cars and 14,612 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended September 19 totaled 53,699 cars, an increase over the previous week of 3,645 cars, but a decrease as compared with the same week last year of 19,020 cars.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
September 19, 1931	53,699	22,273
September 12, 1931	50,054	20,160
September 5, 1931	53,204	23,593
September 20, 1930	72,719	32,424
Cumulative Totals for Canada		
September 19, 1931	1,835,741	985,692
September 20, 1930	2,307,394	1,275,400
September 21, 1929	2,574,158	1,567,904



Double-Pressure High-Pressure Three-Cylinder Locomotive Just Completed by the American Locomotive Company

N. & W. Boosts Automatic Domestic Stokers

AS a further step in its efforts to promote the sales of its coal producing patrons the Norfolk & Western is offering proof that bituminous coal is unusually efficient and economical when used with automatic stokers in domestic heating plants. The railway has announced the results of exhaustive tests of two representative stokers using the low and high volatile bituminous coals mined on the railway's line in Southern West Virginia, Southwestern Virginia and Eastern Kentucky. The tests were conducted in the road's laboratory at Roanoke, Va., and under the supervision of its engineer of tests, who stated, in the conclusion of his report:

"The experience with the two automatic stokers which, it is believed, are fairly representative of the best of this class of equipment, shows that both the high and low volatile coals mined on the Norfolk & Western can be satisfactorily used with automatic stokers in domestic heating plants with greater efficiency and better heat regulation than under expert hand-firing, and, after proper installation and adjustment, with a minimum of attention." The results of these tests have been incorporated in a booklet which is being distributed by the Coal Traffic Department of the railway. A summary of the report follows:

Automatic stokers for firing domestic heating plants is a development which has been making rapid strides. These stokers add to the convenience of heating homes and provide facilities for using coal with the ease of attention and automatic regulation comparable to the use of gas and oil and with that economy which usually is favorable to bituminous coal.

In order to approach a practical condition as nearly as possible, a residence was selected as typical of the type of home where a stoker might be installed. This residence consists of eleven rooms and two large and one small hall. The radiating surface required was calculated and the amount of radiation indicated that a boiler of 2,600 square feet of rated capacity (water) would be proper for such an installation. Therefore a boiler of this size, having a grate area of 5.28 square feet, was purchased and installed in the testing plant. Suitable facilities for absorbing the heat and instruments for determining and recording the results were applied.

Two representative types of stokers adaptable for burning bituminous coals in residential heating have been thoroughly tested. In the installation of these two types of stokers the boiler was elevated 24 inches above the floor, thus providing a space of 31 inches between the top of the stoker retort and the crown of the furnace.

Three rates of firing were established: a rate required to heat the residence to 70 degrees, at an outside temperature of approximately zero, and with 1½ changes of air per hour, with a 15 mile per hour wind; a rate of firing to meet the above conditions except at an outside temperature of 35 degrees; and a rate to meet the same conditions at an outside temperature of 65 degrees. Tests were also made to correspond to varying degrees of outside temperatures within the foregoing limits. Most of the tests consisted of a continuous operation for 96 hours although some were extended to 167 hours.

The coal consumption required to meet the zero outside temperature was from 15 to 19 pounds per hour.

The consumption required to meet the outside temperature of 65 degrees was just as small an amount of coal as necessary to keep the fire alive and this averaged about two pounds per hour.

Low Volatile Coals

The low volatile sizes tested consisted of the following: Nut, 1 in. to ½ in.; pea, ½ in. to ¼ in.; slack, 1 in. to 0.

The volatile in these coals varied from 15.78 to 22.02 per cent. The tests clearly indicated that these low volatile coals, as mined in the Pocahontas and Tug River fields, can be very satisfactorily used in these stokers. The over-all efficiency of each coal was good and in each case exceeded the efficiency obtained with closely supervised hand-fired methods. The average efficiency of the three grades was practically the same. The efficiency at the high rate of firing, corresponding to an outside temperature of zero, was greater than at the medium rate of firing for intermediate outside temperatures and still greater than the efficiency at a very low rate of firing corresponding to mild outside temperatures.

To keep the fire in good condition it was found desirable to remove the accumulated ash, mostly in clinker form, at intervals corresponding to the burning of each 500 pounds of coal. In practice this meant the removal of ash once a day during zero weather conditions and once every two or three days during milder weather. No other attention was found necessary after the proper air, thermostatic and time controls were once regulated to meet the characteristics of the coal being used.

To maintain the fire bed in good condition and to prevent the fire from burning out under conditions corresponding to a low rate of firing in very moderate weather it was found desirable to introduce a damper in the blower air duct. This damper is a simple affair, so hinged as to close and automatically retard the natural draft during the periods of non-firing and to automatically open under the forced draft of the fan. Such a damper can be easily provided in commercial installations. The coal was burned in a practically smokeless manner; only a trace of color was observed occasionally at the top of the chimney.

High Volatile Coals

The following high volatile coals were tested: Winifrede 1 in. stoker, 1 in. to 0; Pond Creek 1 in. stoker 1 in. to 0; Thacker 1½ in. stoker, 1½ in. to 0.

The volatile matter in these coals varied from 28.68 to 36.82 per cent. All of these high volatile coals gave satisfactory results and the tests clearly indicated that high volatile coals of the character shown can be used efficiently in these stokers.

Each coal showed practically the same over-all efficiency. As with the low volatile fuels in all cases this efficiency was greater under stoker firing than under closely supervised hand-firing but the efficiency of the fuel was highest at the high rate of firing, corresponding to a cold outside temperature. Attention to ash and dampering was found to be required on the same basis as with low volatile coals. Smoke density at the top of the stack was low. No attention except ash removal was found to be necessary after air, thermostatic and time controls were properly regulated.

LABOR ORGANIZATIONS on Mexican railways are preparing to meet in Mexico City in December to discuss the formation of a single organization instead of several now representing the different classes of work on the railroads.

Rate Arguments Concluded

Fifteen per cent case submitted to Commission for decision

WASHINGTON, D. C.

EX PARTE 103, in which the railways are seeking permission of the Interstate Commerce Commission for a general 15 per cent increase in freight rates, is now before the commission for decision. Eight and a half days of argument was brought to a close on Wednesday, September 30, the commission's hope that enough time might be saved out of its announced schedule to finish on the previous Saturday evening, having been disappointed. Chairman Brainerd several times requested the elimination of repetition so that the time could be devoted to special situations or new matter, but if any repetition was omitted it was not noticeable and it saved little time.

Approximately 75 arguments were presented by counsel for railways, security holders, state commissions and various agricultural and industrial organizations, mainly producers of raw materials.

There was little dispute as to the need of the railways for greater revenues, although there were some arguments that their need is not enough to constitute an emergency, but a common contention was that they cannot expect to increase rates during a depression when prices are reduced and that higher rates would not produce greater revenues because of the diversion of business to other forms of transportation or to competitors who would be less affected by a percentage advance in freight rates. Apparently those who would be benefited by this effect of a percentage advance were not represented.

On the principal legal question involved there were many to dispute the argument of the railway counsel that Section 15a was intended to create a new concept of reasonableness of rates, while others attempted to meet it by asserting that the law certainly does not require the commission to raise rates in the absence of conclusive evidence that higher rates would increase revenues. There were many contentions that the railways had failed to make their case by declining to present traffic witnesses to testify that higher rates would increase revenues.

There was some criticism because the railways had made no effort to reduce wages before asking for higher rates and still more because they had failed to reduce the expenses of passenger service in proportion to the reduction in passenger traffic. Most of the time, however, was devoted to showing the depressed condition of the various industries represented in an effort to demonstrate that they cannot stand higher rates, or that rates should be reduced. Many objections also were made by representatives of the shippers to the idea of leaving it to the railroads to make the adjustments they propose if the general level of rates is advanced and to the proposal to apply a percentage increase to rates only recently advanced by the commission.

Commissioner Aitchison raised the question as to whether, taking the carriers' argument at its full face value, the commission would have any escape from increasing passenger fares.

Former Governor Clyde M. Reed, of Kansas, appearing for the farm organizations, declared that railroad profits during the past decade have been substantially equal to those made by other industries and that if all the industries could be averaged together the showing would "likely be less favorable than is made by the railroads as a whole." He said that ideally, railroad rates, like taxes, ought to be increased in periods of prosperity and lowered in periods of depression. "If it be conceivable," he said, "that, under the circumstances, the outcome of this proceeding should be the laying of an additional and unjustified burden upon business in general and agriculture in particular, the repeal or modification of any legislation used as a pretext to this end would be clearly forecast."

John E. Benton, general solicitor of the National Association of Railroad and Utilities Commissioners, who appeared for the legal committee of western state commissions, criticized the railroads for not having taken steps to bring about a reduction of wages and for not having made greater reductions in passenger service. Separate arguments were also made by representatives of a dozen western states but the only eastern state represented was Massachusetts. The assistant to the attorney general entered an objection to a rate increase in the name of the attorney general and the governor.

John Finerty, representing the National Sugar Refining Company, said that there are places where sugar rates could be advanced without objection but he opposed the percentage method as affecting companies that have to ship long distances by rail more than competitors that can use trucks for short hauls. Four arguments were made on behalf of companies engaged in the production of non-ferrous metals, copper, lead and zinc, based both on the condition of the industry and on testimony that any increase would divert shipments to water transportation. Mr. Finerty said it would "revolutionize" the distribution of copper.

Allan P. Matthew, for the California Growers and Shippers' Protective League, criticized the refusal of the carriers to produce and of the commission to subpoena, traffic witnesses. He said the roads are asking the commission to make the "assumption" that an increase in rates will produce greater revenues without any proof as to any particular character of traffic.

Return on Valuation

K. D. Loos, of the California Citrus League, brought up the question of valuation, saying that the figures of the Bureau of Valuation put in evidence indicated a valuation of about 25 billion and that if a 15 per cent increase were applied to the traffic of 1929 it would give a return of about 8 per cent on that base. On the other hand, he said, if the cost of reproduction less depreciation figures were reduced in proportion to the drop in general commodity prices the valuation would be reduced to about 16 billion. When he suggested that the percentage of fair return be reduced Commissioner Aitchison asked if the Supreme Court had ever sustained a rate less than 5¾ per cent. Commissioner Eastman interjected that the Court's decisions had applied to single companies, not to the average for a whole industry. When Mr. Loos said that operating costs

should be reduced by falling prices Commissioner Aitchison asked if he had considered what might happen to operating expenses if depreciation is to be included in them.

F. B. Dow, representing the National Sand & Gravel Association, said that its members are in sympathy with the efforts of the railroads to increase their revenues but that higher rates would tend to divert business to wayside pits and trucks and he pointed out that the roads had already made a large number of voluntary reductions under the rates prescribed by the commission. He said that sand is being transported by water from Sarnia, Ont., 600 miles, to Chicago and delivered at the same price as sand moved by rail 60 miles. Mr. Dow said that certainly there is nothing in Section 15a to require that all rates be readjusted in one big case and he pointed to some large advances affecting clients of his made by the commission in Hoch-Smith revisions to show that the commission doesn't always "whittle."

Diversion of Fruit Traffic Predicted

W. P. Ellis, for northwestern apple and fruit growers, sought to ascribe to high freight rates the difficulties experienced by the apple growers in marketing their product. He said that a large percentage of the orchards are being torn up and that only the best located and managed orchards are able to operate at a profit. When he criticized the railroads for their failure to reduce eastbound rates for export Commissioner Porter pointed out that the roads had been willing to reduce the short-haul rates westbound to the Pacific Coast ports. Mr. Ellis said the growers had never been able to understand why they had failed to reduce the transcontinental rates. He estimated that the roads had lost $5,000,000 a year in revenues by failing to reduce eastbound rates and as much more by the pulling up of orchards and that $8,000,000 more would be diverted to trucks and boats if the rates are increased. C. R. Marshall, speaking for the Growers & Shippers League of Florida, estimated that 7,000 carloads of citrus fruit were shipped from Florida last year by truck and that the equivalent of 1,500,000 boxes were left unpicked. He said more fruit from Florida would move by truck and water this year.

Arguments in opposition to an increase in coal rates were made by Arthur Hale, J. V. Norman, August Gutheim and E. S. Ballard. The latter objected to the proposal to apply specific advances to coal rates, in order to preserve differentials, instead of the percentage advance.

C. E. Elmquist and S. J. Wettrick opposed an increase in rates on lumber from the Northwest, pointing to the greatly reduced production in competition with substitute materials and lumber located nearer the markets and declaring that the lumber industry is in a more precarious condition than the railroads. Mr. Elmquist said that for seven years lumber has been sold in the west at a loss. J. V. Norman and R. C. Fulbright appeared for southern lumber interests.

C. E. Cotterill, for the Southern Traffic League, said it was neutral on the question of a general increase but felt that if the commission should decide that increased revenues are necessary the decision should be based on other parts of the law aside from Section 15a. He also opposed the idea of "compounding" increases by adding 15 per cent to rates only recently increased by the commission. When he suggested that the railroads should have considered a reduction of wages and that the shippers should have had more to say about the ruling of the commission that it would not receive evidence relating to wages in this proceeding, Commissioner McManamy asked if any branch of the government has any authority to initiate a wage reduction. Mr. Cotterill said he understood not, but that the carriers could have initiated the matter. Commissioner Meyer remarked that there had been a demand for expedition and that to have included the wage question might easily have prolonged the proceedings from five to fifteen months.

Freight Service Characterized as Profitable

E. E. Williamson, appearing for the Newport Rolling Mill and other companies, presented an elaborate statistical study to show that when traffic was good the railway freight service, separated from the passenger service, was increasingly profitable, while the passenger service, without making any contribution toward capital, was actually showing a deficit in 1928 and 1929 after charges against it for its proportion of equipment and joint facility rents and taxes. He also said that while loaded freight car miles had increased only 41.4 per cent from 1923 to 1929 the empty car miles had increased 96.5 per cent. He therefore suggested that the railroads eliminate every unprofitable passenger train "that can reasonably be eliminated" and eliminate unnecessary trains between important cities by a pooling plan. He also suggested that the roads might obtain an increase in the rates for hauling United States mails. He did not suggest a reduction in railway wages, but showed that while the number of employees was a little less in 1929 than in 1910 their total compensation had increased 157 per cent. He also showed that while the net operating income was 13.4 per cent less in 1921-1929 than in 1895-1910, the increase in compensation was more than half of the decrease.

Using statistics put into the record by the commission's Bureau of Statistics showing net operating revenues for freight and passenger service, according to the Bureau's method of separating freight and passenger expenses, Mr. Williamson said that while the carriers claim a reduction of $890,170,000 in freight revenue in 1929 due to declining average revenue per ton mile, the reduction in freight expense for 1929, as compared with 1921, was $1,456,479,003. "In other words," he said, "the reduction in expenses would have been in 1929 under 1921 $566,309,003 more than the claimed reduction in revenue. There was therefore, really no 'whittling' away of the carriers' revenue in the sense in which this term is used by them." His exhibit showed that the increase in freight net revenues between 1923 and 1929 was equivalent to a return of 14 per cent on the increase in capital investment during that time.

O. W. Tong, for the Potato Traffic Association, urged the commission to exempt potatoes from Maine, Wisconsin and Minnesota from any increase. He said that the farm price of potatoes in Maine has fallen to 50 cents a barrel, which is the amount of the freight rate to New York, and that if the rates are increased the Maine growers will ship via Canadian lines and water. He estimated that this would cause a reduction of 50 per cent in the rail revenues on potatoes.

C. E. Blaine, for the American National Livestock Association, said the railroads had not been operated efficiently and while asking to take advantage of one section of the law they have not complied with other provisions of the law relating to consolidation, pooling and recapture. He criticized them for not having made greater reduction in passenger service and in circuitous routing of freight. Commissioner Meyer asked if the shippers would be willing to give up their right to designate the routing of their freight. Mr. Blaine said he

thought they would not object but that he did not believe this would result in any reduction in the number of solicitors. Commissioner Meyer said it might reduce the power of the "traffic club."

Spencer Gordon, for the National Canners' Association, said that if agricultural products are excepted canned fruits and vegetables should be included with them because they are in competition with fresh fruit and vegetables. He said the canners do not want to use trucks but that they have been forced to use them in an increasing extent and that an increase in rates will widen the area in which they must use them. J. C. Colquitt, for the southern furniture manufacturers, said their freight rates have been increased several times since the war while the value of the product has been going down, and he asked the commission not to add a further increase to those recently ordered as a result of the general furniture investigation.

Rebuttal

The rebuttal argument was begun on September 29 by Charles E. Hughes, for the security-holders' committees, who asked the commission not to override the judgment of the railway managements that the increase sought is the only way to meet the present situation. When he said the railroads had never had the fair return contemplated by the law Commissioner Eastman asked if he knew of any period in which the roads had earned as much as in the past decade. Commissioner McManamy asked which would be the greater calamity, a drying up of the sources of credit or the drying up of the traffic. Mr. Hughes said a third calamity would be worse than either, a decision by the commission preventing the railroad managements from doing what they think they ought to do.

Mr. Hughes devoted most of his time to correcting what he said were inaccuracies and misunderstandings put into the record by R. C. Fulbright, who had made the principal attack on the position that railroad credit has been collapsing.

Grenville Clark, counsel for the savings banks and insurance companies, answered the argument that it is wrong to attempt to raise rates at a time like this by saying that the commission is asked to support the "second foundation stone" of the country, just as the Postmaster General is proposing to "increase the price of government" by urging higher postal rates. He said the testimony to the effect that industry cannot pay higher rates has great weight but is based on the premise that a restoration of confidence in railroads will not help business. He pointed out that the insurance companies that are supporting the rate advance are even more interested in business generally than in railroads. He also said that the argument that a rate increase would divert business also has weight but only on the assumption that a rate increase would not help business generally and that it would be permanent, whereas he regarded a rate increase as merely a step toward a permanent solution of the railroad problem. He asked the commission not to act on the preponderance of evidence but to weigh its effect and give due weight to the opinions of the responsible officers of the carriers. The commission had very properly, he said, excluded testimony as to railroad wages, "yet everyone knows that denial of the rate increase will accelerate and force a wage controversy, with its protracted procedure, although it will not settle the question as to whether there is to be a reduction in wages."

Clyde Brown, general solicitor of the New York Central, in his rebuttal argument for the carriers, answered the question so often asked during the proceedings by Commissioner Meyer by saying that technically the case is a Section 6 case but fundamentally a Section 15a case and that the commission should not treat the proposed rates as maximum reasonable rates because the roads are asking for less than enough to produce a fair return. In reply to arguments in contravention of the railroad interpretation of Section 15a as having added a new requirement that rates shall be adequate to the old requirement that they shall be "just and reasonable," Mr. Brown pointed out that there never was any definite standard of reasonableness except in a theoretical sense and that the law attempted to provide a more definite yardstick. While the commission has accumulated many volumes of decisions as to the reasonableness of rates, he said, it is impossible to find in them any formula which will show what the commission would decide as to any rate the next time it came before it and that "a just and reasonable rate is still what this commission may decide after considering many factors." Commenting on the argument made by John E. Benton, for the western state commissions, that the railroad interpretation of Section 15a was based on a misconception, Mr. Brown read from an argument made by Mr. Benton before a Senate committee in which he had referred to the section as having created a "profound change" in the law and a "new standard of reasonableness" "regardless of economic conditions." He said that then Mr. Benton was seeking a "legislative repeal" of the law, whereas now he is urging "administrative nullification" of it. Mr. Benton pointed out that in the same argument he had said that he had never believed the new law required the commission to impose unreasonable rates.

Mr. Brown said the commission had applied to law as the railroads understand it in the 1920 case and again in the 1922 case, when it held that lower rates would be more conducive to a fair return than the existing rates, but he pointed out that those who have contended that an improvement in the railroad situation following the 1922 decision was the result of the lowered rates overlook the fact that there was also a large reduction in railroad wages at the same time. Later, he said, the commission departed from its earlier construction of Section 15a, perhaps because of what it thought was required by the Hoch-Smith resolution.

As to the argument that a rate increase will defeat its purpose by diverting traffic from the railroads, Mr. Brown said that aside from general expressions of opinion the testimony indicated only that some of the traffic would be diverted, for some of the hauls, and that while "many shippers came here to kiss us good-bye" others had pointed out that they were dependent upon rail transportation. Commissioner Eastman asked if he thought it had not been shown as to any commodity or class of traffic that the net effect of an increase would be the loss of the traffic. Mr. Brown replied that he had not had his attention called to any case, except as to a part of the traffic, and he pointed out that there are many instances now in which it can be shown that shipments are moving by rail for long distances in competition with shorter routes or other forms of transportation in spite of the rate disadvantage. He said that all the diversion that is going to happen anyway is being used as an argument against a 15 per cent increase and he asked the commission to have its examiners make a check of the record to find out what traffic would probably be diverted that would not be diverted under present rates.

Commissioner Farrell said he had failed to find in the

record evidence to offset that of the shippers, which was "all one way," but that the carriers had not offered it. Mr. Brown replied that to have done so would have taken six months or more and that meanwhile "the dog would have been dead." "What we had to do," he said, "was to rest on our conclusion that the opposite has not been proved." Commissioner Meyer remarked that in the northern grain case the carriers had testified that if the commission should attempt to increase other rates to make up for a reduction on grain the traffic would leave the rails. Commissioner Eastman asked if the commission should find that rates ought to be reduced where traffic has already left the rails. Mr. Brown replied that in writing the railroad application he had pointed out that it was impossible to obtain a reliable estimate of the traffic that might be diverted and that there may be some cases where reductions will be necessary. He said that a great deal of adjustment would have to be done, under the supervision of the commission, if the increase is allowed, but that the only thing to do now is to make a general 15 per cent increase.

Air-Cooled Pullman Cars Probable Next Summer

THE study of air conditioning of Pullman and other railroad cars is proceeding at such speed and so successfully that it seems probable that next summer a number of trains will be so equipped, according to the Pullman Company. Some of the experimental Pullman air-conditioned cars will be all-year-round cars in that the equipment provides for furnishing warm air to the cars in winter through the air duct system in a manner similar to that followed in furnishing cool air during summer. Experiments on air-cooled cars have been conducted during the past few years and at the present time several of these cars constructed by the Pullman Company are receiving tests in actual service on lines all over the country. One system now used by the Pullman Company has mechanical refrigeration, another uses ice as a cooling agent and a third has a water spray device. Work on a steam jet system was started several months ago. In the cars now in service, it is possible to show a marked difference between the temperature in the car and that outside, in one case, an outside temperature of 113 deg. being reduced to 84 deg. within the car.

In the air-cooled cars, which can also provide warm air during the winter, the pressure inside the car is somewhat higher than the outside atmospheric pressure, due to the forced air ventilation system. In all experimental cars, the dust is kept from entering the crevices and crannies through which it enters most of the cars that are in service on the railroads today. This forced air system provides results which are just the reverse of the exhaust system of ventilation which has been standard for so many years. Exhaust ventilators reduce the pressure within the car and, therefore, invite the entrance of dust.

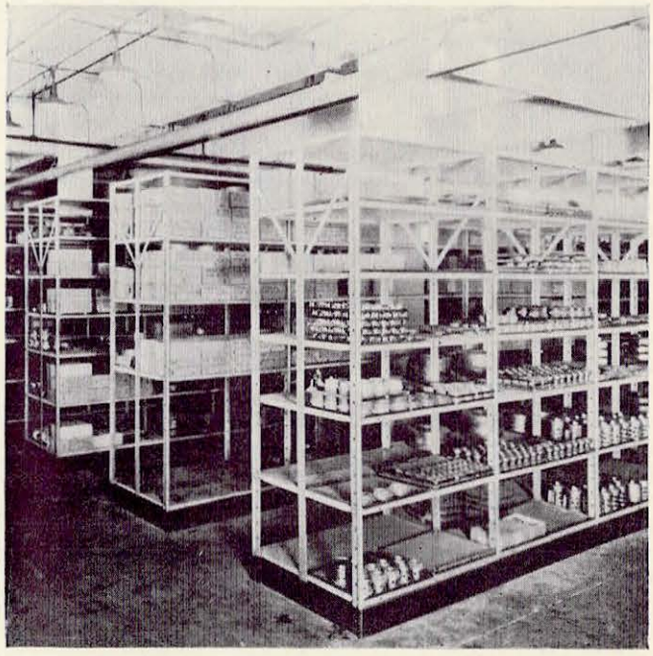
The problem which still remains to be solved concerns mostly the economic side of the question rather than that of engineering, the reason for this being that the cost of installing this air-conditioning equipment is considerable. The air-cooling problem is also receiving the attention of several railroad systems, which are experimenting along different lines. The Atchison, Topeka & Santa Fe and the Missouri-Kansas-Texas are operating cooled dining cars in the Southwest, and the Baltimore & Ohio is running the Columbian, a train of air-cooled cars between New York and Washington.

One of the first proposals for the air conditioning of trains was to provide a cooling system in the baggage car, where steam from the locomotive could operate the necessary refrigeration machine for cooling the entire train. This required the circulation of cold brine from the baggage car through all the cars and back again to the baggage car. To circulate this brine would have made additional hose connectors necessary between the cars. While considerable thought was given to this head-end system, it was abandoned early because of the disadvantages from an operating standpoint.

It was soon decided that it would be necessary to provide a system that would be self-contained in each car and would operate independently of all other cars. Electricity, as a source of power, was adopted but difficulties immediately presented themselves because there was not available an axle generator large enough to furnish the current. In addition, belt-driven machines in larger capacities than are now in common use do not operate properly because of belt slippage. After much study to develop a means for driving a larger generator, a method was discovered for securely clamping a drive gear to the axle without resorting to special axles, which would have necessitated the stocking of thousands of special axles for repair purposes. This method consists in the use of a rubber sleeve, inserted between the gear and the axle, with the result that after clamping the gear in place no slippage occurs.

While mechanical systems of refrigeration were being developed, considerable study was made on the use of ice as a cooling medium. A sleeping car, the McNair, was so equipped and is now being tested in the Middle West. Another ice-cooled car, embodying new features, will be in operation in the next few days.

* * *



In the New Store of the Illinois Central at Paducah, Ky.

Communications and Books...

Favors Wage Reduction

CINCINNATI, OHIO.

TO THE EDITOR:

In a letter in reply to one of mine published in *Railway Age* of August 29 "G.M." suggests in the September 12 issue that Congress and the I. C. C. should "do something" about the railway situation. This sounds exactly like a one crop farmer. We did something about them, and are paying a heavy penalty. We shall have to do something about the railroads too, and let us hope that proves not as expensive.

The best thing that could be done would be a ten per cent wage reduction. Not only would this save the railroads millions, but the wage-earner would still be receiving more actual purchasing power than he did in 1929, living costs having dropped at least fifteen per cent.

Certainly regulation must encompass all transportation so that the fight, if there must be one, is fair, but G.M. forgets that Congress at one time did do something for the railroads. In 1920 it passed the Esch-Cummings Act permitting widespread consolidation. The railroads are still fighting over it, not like great service agencies in the interest of the nation, but like feudal lords of the tenth century. Here they are clearly at fault. G. M. overlooks the fact that through the medium of holding companies the railroads can control all forms of transportation; this, some roads like the "Pennsy" are doing. If this is done quietly and intelligently holding companies will escape regulation. If the railroads revert to the methods of the last century the same old story will be recounted again. They have the American Telegraph & Telephone Company as a good model of corporate statesmanship.

G. M. puts forth the safety factor. Of this there can be little doubt. Yet, more people are flying every day and, if one can believe the U. S. Department of Commerce, the number of accidents on regular air transport lines is very little, if at all, greater in proportion than on railroads. The difference is, of course, in the fact that in a train wreck one has a chance of escape; in an airplane accident one's chances are slight. But that is the same old cry. For a long time people were afraid of railroads, too, and we all know the great dangers inherent in driving a car; yet we drive cars.

Passenger traffic, says G. M., would gladly be dispensed with by the railroads if they could do so without a terrific loss. Knowing nothing about what railroads really want to do, one can only judge by what they are doing. Passenger traffic may be a loss, yet the Pennsy not only is electrifying on a main passenger route, but also is building new stations at Newark and Philadelphia, and improving passenger facilities at Baltimore, Trenton, and eventually at Pittsburgh. The Reading and Lackawanna have recently electrified those portions of their roads handling the most passenger traffic. Before the depression beautiful new stations were planned and built or in process of building at Omaha, Oklahoma City, Boston, Cleveland, Cincinnati and Los Angeles. (The latter case has been forced on the railroads by the State Railroad Commission it is believed.) There have been articles in the reputable "Business Week" to the effect that many "crack" trains make money for the railroads in good times. Even in these times, when service is improved (air cooling on the B. & O.), the trains make money. Finally, though passenger service may be a drain, the Pullman Company lives on it; perhaps its views are different on the subject.

It is true that the Atlantic steamship lines started their cruise service as a "last try" to overcome depression. The railroads have done the very same thing. The success of the shipping venture has not yet been appraised, but on the trip referred to there was a capacity crowd and money was made. Significant is the fact that one transatlantic line is making money because its equipment is the last word in luxury and speed.

As to freight rates and indirect taxation charges, G. M. is undoubtedly correct. Buses and trucks should be taxed like the railroads. Yet, when a road is built, all, even the railroads may use it. The railroad buses and trucks, which they are using more and more, are not unduly taxed. Assuming that we are being taxed for waterway and road construction and maintenance, as mentioned, still we all use roads, the railroads included, and a river highway at Cincinnati is a public improvement. It is not the waterway, but the fact that the government runs the barges, which should be objected to. Pittsburgh steel companies seem to ship on the river at a profit. For the same reason the Mahoning Valley Steel companies want a canal to Lake Erie. Public improvements are always expensive and their benefits often questionable, but that is not going to stop them. The railroads should be allowed to run the barges on the rivers, as well as all types of transportation. If that comes to pass we shall see them urging more roads and better harbors; they, too, may overlook taxes for public improvements.

Finally, do railroad executives or do they not lend support to candidates for political office who are outspoken advocates of waterway development?

EDGAR J. MACK, JR.

New Books

Useful Information About Lead, 104 pages, 5½ in. by 8¼ in. Bound in cloth. Published by Lead Industries Association, 420 Lexington avenue, New York. Price $.50.

This book tells concisely the story of lead and its principal uses, with short chapters devoted to the part played by lead in major industries, the history of lead, its mining, smelting and refining. A number of valuable tables are included, one of the most important being that with regard to the properties of lead, including mechanical, thermal, electrical, optical and other constants of the metal.

Railroad Curves and Earthwork (with tables) by C. Frank Allen, professor of railroad engineering, Massachusetts Institute of Technology. 540 pages, 7 in. by 4 in. Illustrated. Bound in flexible fabricoid. Published by the McGraw-Hill Book Company, Inc., 370 Seventh Avenue, New York. Price $4.

This constitutes the seventh edition of Allen's text on Curves and Earthwork and the fourth edition of Allen's Tables, which appeared at one time as separate volumes. The text has been enlarged to include a chapter on the String Lining of Curves, and the chapter on Turnouts has been materially revised and rearranged. Tables on Mean Refractions and Altitude and on Correction for Parallax and Refraction have been added, and a table of middle ordinates for a 45-ft. rail has been replaced by one for a 39-ft. rail.

Proceedings, American Association of Railroad Superintendents. Edited by F. O. Whiteman, secretary. 414 pages, 6 x 9 in. Bound in paper. Published by the association, 1017 Olive street, St. Louis, Mo.

This volume contains the proceedings of the 38th annual meeting which was held at St. Louis on June 9-12. It contains the reports of some 14 committees on 28 operating subjects. The volume also includes addresses by B. H. Mann, consulting signal engineer, Missouri Pacific; Harry Guilbert, director of safety, the Pullman Company; L. G. Bentley, supervisor of safety, Chesapeake & Ohio; H. A. Rose, chairman, Safety Section, A. R. A.; Samuel O. Dunn, editor, *Railway Age;* and Joe Marshall, special representative, Freight Claim division, A. R. A. These reports and addresses, with the discussions thereon, constitute a valuable addition to the literature on current transportation problems.

Odds and Ends . . .

Headline of the Week

This week's prize for the most breath-taking headline goes to the Railway Gazette (London), which impressed the readers of its August 28 issue with the following: "Psychotechnical Investigations in Staff Recruitment and Allocation."

Partisans

On the "Shakespeare Express" from London to Stratford-on-Avon, a special label, showing the head of the poet, is now provided for passengers' luggage. "Punch," the famous London weekly, comments, "This definitely ranges the railway authorities in opposition to the Baconian theory."

Wild Life on the C. N. R.

We are surprised that the Canadian National, in its advertisements, does not make a point of the excellent hunting which may be enjoyed en route. The Canadian National Railways magazine tells of a passenger on the Oak Point line in Manitoba, who was sitting in a day coach when a partridge flew against the window of the train, broke the glass, and landed in a lady's lap, handily solving her wifely problem of what to have for dinner. In another instance, a goose flew into the side of a locomotive and was captured by the engineer while the train continued its run.

Uncover Old Railway Line

A grading machine preparing the right of way for the pavement of a new street in Royal Oak, Mich., unearthed a part of a 93-year old roadbed of the Detroit & Pontiac railroad, the first in the state of Michigan. A number of wooden stringers were exposed. According to James G. Matthews, city historian, the ties of the railroad were laid on these stringers, probably in 1837. The stringers were found about 3 ft. below some abandoned Grand Trunk tracks. They are mostly of black walnut, which was abundant in Michigan during the first half of the nineteenth century. The ties and rails had apparently been removed when the later roadbed was graded.

How Sweet the Breeze

One of the first things which railroad men learn is that, when passing stockyards, it is highly desirable to walk on the windward side. There are exceptions to all rules, however, and we are assured by credible informants that such is the case in Philadelphia where the Pennsylvania has constructed new facilities for the handling of livestock, which do not offend even the most sensitive nose. In fact, it is said that the Pennsylvania did such a good job in disguising the facilities and in providing for the utmost in sanitation, that the stock pen building, were it not for the occasional grunt of a pig or bleating of a sheep, might be taken for a model three-story factory building. *Sic transit gloria* stock yards.

Station Restaurants

Having felt for a long time that railway station restaurants and the food which they purvey are by no means as bad as the average traveling man would have you believe, we were glad to read the compliments which the writer, Beverley Nichols, paid to the station restaurant at Edinburgh, Scotland, in a recent issue of the Daily Mail, London. Mr. Nichols wrote, "There are good restaurants in Edinburgh, but they are fewer than in any other city of its size which I have ever visited. It is significant that the easiest place to get a meal which can be eaten with relish—apart from a very few hotels—is in the railway station. I was entertained on more than one occasion in the station, and was very grateful for it, too."

It is our recollection that the Fred Harvey restaurant in the Kansas City Union station was at one time, and probably still is, the most highly-regarded restaurant in that city. To entertain or be entertained at the Harvey restaurant was quite the thing in Kansas City society.

"Air-Conditioned" Recreation

"Patrons of the Texas Special and on the Bluebonnet," says the M-K-T Employees' Magazine, "are loud in their praise of the Katy's consideration of their comfort and pleasure in making the new air-conditioned diners available for use as recreation cars between meals. Stewards provide decks of cards, chess, checker, and domino sets and invite passengers to make themselves at home. It is also explained that use of the cars for games involves no obligation to order refreshments, and that the waiters are in attendance only to be of any service that may be desired.

"So far as is known, the Katy is the first and only railroad in the country to open its diners between meals for the use of passengers. The cars are also made available for passengers immediately after the evening meal and are often filled until midnight."

Find Predecessor of the Illinois Central Magazine

A copy of what is believed to have been a predecessor or possible parent of the Illinois Central Magazine was recently discovered in the office of C. C. Haire, auditor of capital expenditures at Chicago. It is the first issue of "The Way Bill" which was first published 34 years ago and which, so far as is known, is the first publication ever to have been issued by members of the Illinois Central organization. The copy recently unearthed bears the date October 1, 1897, and consists of eight pages of reading matter, without illustrations.

The Illinois Central Magazine has published a reproduction of part of the first page of "The Way Bill," and we note with pardonable pride that the *Railway Age* is mentioned in the very first sentence. The *Railway Age* also comes in for mention in another item, although in this case the circumstances are a trifle dubious. "The Way Bill" reprints an item from the *Railway Age* describing the speed of a special train on another railroad.

"This train made one stretch of 43 miles in 39 min.", the item reads, "and it must have gone still faster at some points, for one newspaper declares the speed of the train attained in long reaches of track produced a suction that pulled up the weeds along the right of way, loosened most of the telegraph poles and subjected the fence posts to a strain that drew the nails in the boards."

Under this item, the incredulous "Way Bill" makes the comment, "Ananias wasn't such a big one, after all."

* * *

A Twenty-Five Cent Freight or Passenger Ticket Issued by the Memphis & Charleston (Now Part of the Southern) on January 15, 1862. The Original is the Property of Dr. B. M. Moore, Middlesboro, Ky.

NEWS

Rate Increase Will Improve Business

Rate structure a mechanism for terminating economic depression

The Board of Directors of the Canton (Ohio) Chamber of Commerce, in authorizing T. V. Buckwalter, vice-president of the Timken Roller Bearing Company, to appear before the Interstate Commerce Commission at its hearing at Chicago on August 29, expressed approval of the proposed freight rate increase basing its opinion on the following reasons submitted by Mr. Buckwalter's committee.

Strenuous efforts on the part of governmental bodies have been unsuccessful in averting the decline in commodity prices, and it is the general consensus of opinion among students of the economic situation that the depression cannot end, and will not terminate, until the decline in commodity prices is definitely arrested.

This commodity price situation is responsible for poor business, for the reason that it is a direct cause of the holding off of orders for goods and materials on the part of merchants, manufacturers, and business men throughout the nation today. It is natural that the business man will refrain from placing an order today for more than to supply his current daily needs, as long as the condition prevails whereby he is reasonably sure of obtaining a slightly lower price next month, or indefinitely in the future.

On the other hand, if the decline in commodity prices is definitely arrested and is given an impetus upward, however slight, the manufacturer and business man would place orders in reasonable quantities; would start the wheels of progress moving, and thus put a definite stop to the depression.

Railway freight rates affect all businesses and all people with no exceptions. An advance in freight rates of 10 per cent to 15 per cent will increase the cost of moving commodities and goods of all kinds. The charges for the movement of goods are a definite part of the cost of manufacture and distribution of commodities.

A rate advance, therefore, will put a definite stop to the decline in commodity prices for the reason that it will be obviously impossible to continue this decline. The resultant slight advance in commodity prices will start a buying movement to cover near-term future requirements on the part of manufacturers and merchants; will start the wheels of progress moving; will give employment to a large number of workers; and will encourage the spending of money to cover future requirements.

A rate advance at a flat rate of say 10 to 15 per cent will upset certain business relations which have grown up around economic and business conditions, and which have been protected by certain rate differentials. It is the attitude of the railroad authorities, and common sense demands that these rate differentials be maintained.

There has never been, in the history of this nation, a time when the railroads were prosperous in a period of depression; and, on the other hand, there never was a time when railroads were prosperous without having a decided beneficial effect on the nation in general. It is ridiculous, therefore, to entertain the supposition that the present depression can be ended, and business restored to a normal basis with the railroads in a condition of impaired financial strength.

The government has, by action of Congress, taken control of the financial affairs of the railroads. This control limits their earnings in periods of prosperity, and imposes limitations on the building up of ample surplus. It is eminently fair that governmental action should, in a corresponding measure, protect the railroads in periods of adversity.

The control of the rate structure by the government through the Interstate Commerce Commission affords a mechanism whereby severe economic depressions, particularly where dependent on commodity prices, can be definitely terminated, and it would be the part of wisdom to exercise that power—grant the rate increase, and terminate the period of depression within the next few months.

Western Roads Ask More Time to Revise Livestock Rates

Tariff-publishing agents of the western railroads have petitioned the Interstate Commerce Commission to postpone from October 26 to January 24 the effective date of its recent order revising western livestock rates, on the ground that it will be physically impossible to prepare the tariff revisions in the time allowed. The southwestern lines have also asked for some modifications of the order.

Ten Per Cent Tax Cut Approved for Missouri Railroads

The Missouri State Board of Equalization at Jefferson City on September 28, approved a flat reduction of 10 per cent in the tax assessment of all steam railroads in the state, making a total reduction of about $28,000,000 and a saving in taxes of approximately $500,000 for the 53 railroads. The reduction follows a hearing before the board on September 21, when the railroads urged a material reduction in the tax valuation of their properties for 1931 taxes, the total valuation being set at $282,104,583 by the Missouri State Tax Commission. At that meeting Attorney General Stratton Shartel submitted a resolution urging a flat reduction of 10 per cent in the tax valuation of railroad properties.

New York Central to Cancel Employee Stock Subscriptions

Because of the sharp decline in the market value of the company's stock and the number of employees it has been found necessary to lay off, the New York Central has offered to cancel employee stock subscriptions made last year on the partial payment plan, and, at the option of the employees, to return with four per cent interest funds already paid in. The stock in question includes 75,000 shares offered to employees in March, 1930, at $130 a share, which was below the market price at that time. Since then, however, the stock has dropped under the subscription price, and has recently been quoted at about 62. Although this is understood to be the first offer made by a railway company to repurchase stock to save employees a financial loss, very little of the amount subscribed for has been turned in as yet, according to company officers.

Unfair Competition Menaces Railroads

Lieutenant governor of New York urges regulation of all types of carriers

A definite policy of removing unfair or inequitable competition in the transportation industry through regulation of all types of carriers was urged by Herbert Lehman, lieutenant governor of New York, speaking at Schenectady, N. Y., on September 24, at a dinner given by the Schenectady Chamber of Commerce and the New York State Historical Society to celebrate the 100th anniversary of the operation, over the Mohawk & Hudson (now a part of the New York Central), of the first railroad train to be run in the State of New York. (See *Railway Age*, September 26, page 494.)

Declining to express an opinion on the 15 per cent rate increase asked by the railroads, Mr. Lehman said it seemed to him that "there are other factors in the railroad situation which go far deeper than the mere question of rates at any given time, or any change in the rate structure calculated temporarily to affect a specific situation, such as the one confronting us today." In explanation of this attitude he cited figures furnished by Paul Shoup, president of the Southern Pacific, to show the increase in highway and waterway transportation, as well as in that by air and pipe line.

"In many instances the cost of these facilities which make this competition possible has been borne, at least in part, by the railroads themselves," Mr. Lehman said. "In other cases, the cost has been defrayed through an additional tax burden on the taxpayer and little or no return has been received by the governmental units from the direct beneficiaries."

"I am convinced that, regardless of changing conditions, the railroad will continue to play a very great role in the economic and social life of every community, and that the reasonable prosperity of the railroad is essential to the prosperity of the community which it serves.

"Many factors, however, have arisen in recent years which have very substantially reduced the earnings of the railroads throughout the country and which accordingly threaten even their reasonable prosperity.

"Such a development is serious, not only because it affects the integrity of the railroad itself and lessens its ability to render adequate service, but it is serious for the public in a broad way.

since general prosperity is still closely bound up with railroad prosperity."

Railroads, he continued, pay out more in wages and salaries than any other one industry, pay heavy taxes, are great buyers of supplies, and have a large volume of outstanding securities held by banks and by a large proportion of the population. Inroads of competition into a business of this nature represent a new development, while the competition itself "is subject to little if any regulation."

"There should be no discrimination or advantage as between users of transportation under like conditions, and no discrimination or advantage as between those who furnish the service. * * * There can be little doubt that there is needed a definite policy which will eliminate or lessen unfair, wasteful and inequitable competition and which will place transportation for hire of every character under substantially equal regulation and control."

Pelley to Address Illinois C. of C.

The Illinois Chamber of Commerce, in connection with its annual meeting at Chicago on October 8, will have a "Transportation Luncheon" at which J. J. Pelley, president of the New York, New Haven & Hartford, will speak on "Railroads Today."

Improvement for Ohio River Authorized

The Secretary of War has authorized the construction of a fixed dam at Montgomery Island, in the Ohio river about 31 miles below Pittsburgh, to replace three movable dams, at an estimated cost of $6,000,000.

Correction

In the tables of Railway Revenues and Expenses for July, appearing in the *Railway Age* of September 12, on page 414, the total of net from railway operations for the first seven months of the current year of the Illinois Central System was incorrectly shown as $1,730,728. This total should have read $11,730,728.

Accidents at Highway Crossings

Fewer accidents took place at highway grade crossings in the first six months of 1931 than in any corresponding period in the past eight years, according to reports received from the railroads by the Safety Section of the American Railway Association. Accidents, 2,114; fatalities, 921; which is below any corresponding period since 1923, in which year the total was the same, 921.

No Married Women to Work on the N. & W.

The Norfolk & Western, effective October 1, will not employ any married women for clerical or other service, and hereafter all women employees, upon marriage, will automatically sever their connection with the company. The new regulations will not apply to married women who were in the employ of the company prior to October 1. This ruling, it is stated, has met with the general endorsement of the railway's clerical employees. It has been made to alleviate existing conditions of unemployment, to bring about a more equitable distribution of employment to heads of families, and to conform to practices of other railroads and large industrial corporations.

A Pennsylvania Heating Contract

The Pennsylvania has contracted with the New York Steam Corporation for the steam requirements of the Pennsylvania Terminal in New York City, including the Pennsylvania Hotel. The contract calls for the supply of approximately 500,000,000 lb. of steam a year. About 40,000,000 cu. ft. of building space is to be served, together with necessary heat for passenger cars.

Rates on New York Peaches Reduced

Freight rates on fresh peaches from points in New York to destinations in Official Classification territory were found unreasonable in a decision made public by the Interstate Commerce Commission to the extent that they exceed 60 per cent of the first class rates prescribed by the commission for eastern territory, to become effective on December 3. The present rates are generally on a second class basis. The New York Department of Agriculture and Markets had asked for fourth-class rates or 50 per cent of the first-class rates.

One Quarter Million Stockholders

The Pennsylvania Railroad on September 1 had almost a quarter of a million stockholders of record on its books; specifically, somewhat more than 240,000, an increase of 32,000 over last year. The railroad's employees comprise almost one-fourth of its entire number of stockholders. More than 50,000 employees, or approximately one-third of the total, are part owners of the company. About 40 per cent of the stock is held in the Commonwealth of Pennsylvania. A considerable increase in the proportion of holdings in New England was recorded, 12½ per cent of the stock now being held in that section.

Rock Island Relief Fund

The Employee Relief Committee of the Chicago, Rock Island & Pacific, during the 10 months ending September 1, 1931, expended a total of $52,649 for food and fuel for employees temporarily out of work. A total of $88,695 was subscribed by fellow employees and officers of the railroad, and of this sum, $36,045 remains for relief work during the coming winter. This fund will be augmented by additional subscriptions by the personnel of the railroad.

Up to September 1, 1931, the relief fund cared for a total of 2,152 families, consisting of 9,511 persons distributed over the entire system. The average cost for food, supplies and fuel was slightly in excess of nine cents per person per day. Supplies were purchased at wholesale prices through the company commissary and distributed by division committees throughout the system. The expense of handling the supplies, approximately $25,000, was borne by the railway company.

Prairie Provinces Get C. N. R. Board Memberships

Hon. R. J. Manion, Canadian Minister of Railways and Canals, announced in Ottawa last week that the provinces of Saskatchewan and Alberta had been accorded representation on the directorate of the Canadian National by the appointment, by order-in-council, of R. Byron Horner, of Blaine Lake, Sask., and James Ramsay, of Edmonton, Alta., as members of the board.

Great Lakes Shippers' Board

The Great Lakes Regional Shippers' Advisory Board held its regular meeting at Akron, Ohio, on September 23. The reports of the commodity committees indicate that the volume of carload traffic during the coming three months will be slightly less than it was in the last quarter of 1930, a total of 348,661 carloads being indicated. Partially offsetting numerous decreases, the following increases are predicted: Fresh fruits, other than citrus, 5.3 per cent; live stock, 10 per cent; automobiles, trucks and parts, 6 per cent, and potatoes 102.4 per cent.

Daniel Willard, president of the Baltimore & Ohio, was the principal speaker before the meeting; his address was reported in the *Railway Age* of September 26, page 483.

Lackawanna Reduces Salaries—Employees Put on Short Time

Effective October 1, salaries of officers of the Delaware, Lackawanna & Western receiving more than $6,000 annually will be reduced from 7½ to 10 per cent; while those receiving less compensation, all others in supervisory capacities and employees paid on a monthly, daily or hourly basis will be put on short time by having two days leave of absence monthly, without pay, which is an equivalent to a reduction of 6⅔ per cent in earnings, according to an official statement made public on September 28. This arrangement will not apply to those officers or employees put on short time, with a consequent reduction in earnings, some time ago as a result of the decline in traffic; nor will it apply to those who are dividing time with other employees in their class.

Club Meetings

The Canadian Railway Club will hold its next meeting at the Windsor Hotel, Montreal, on Monday evening, October 19. E. R. Mellenger will present a paper on recent designs of Diesel engines for locomotives.

The Toronto Railway Club will meet at the Royal York Hotel, Toronto, Ont., on Monday evening, October 5. John L. Bacon of the Valve Pilot Corporation, New York, will present a paper on "New Savings for the Balance Sheet."

The Central Railway Club of Buffalo will hold its next meeting on Thursday

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"THE PINE TREE LIMITED"
"THE FLYING YANKEE"
AND "THE GULL"...

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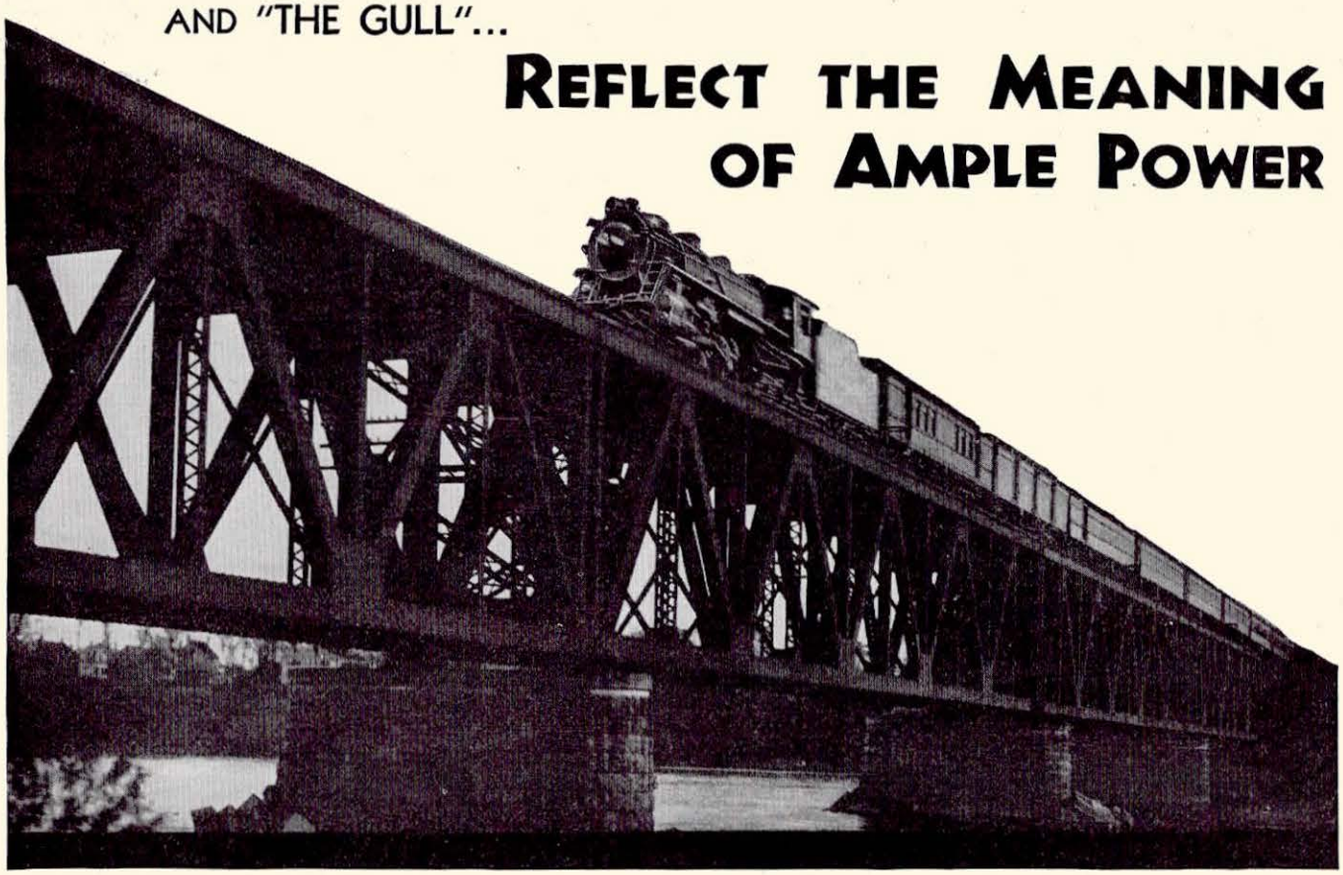

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Heavy trains with Pullman equipment need the extra power of the Booster for the same reasons that have resulted in their wide use for freight and switching service.

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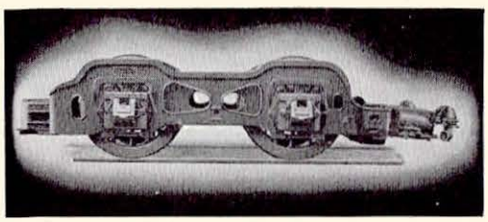

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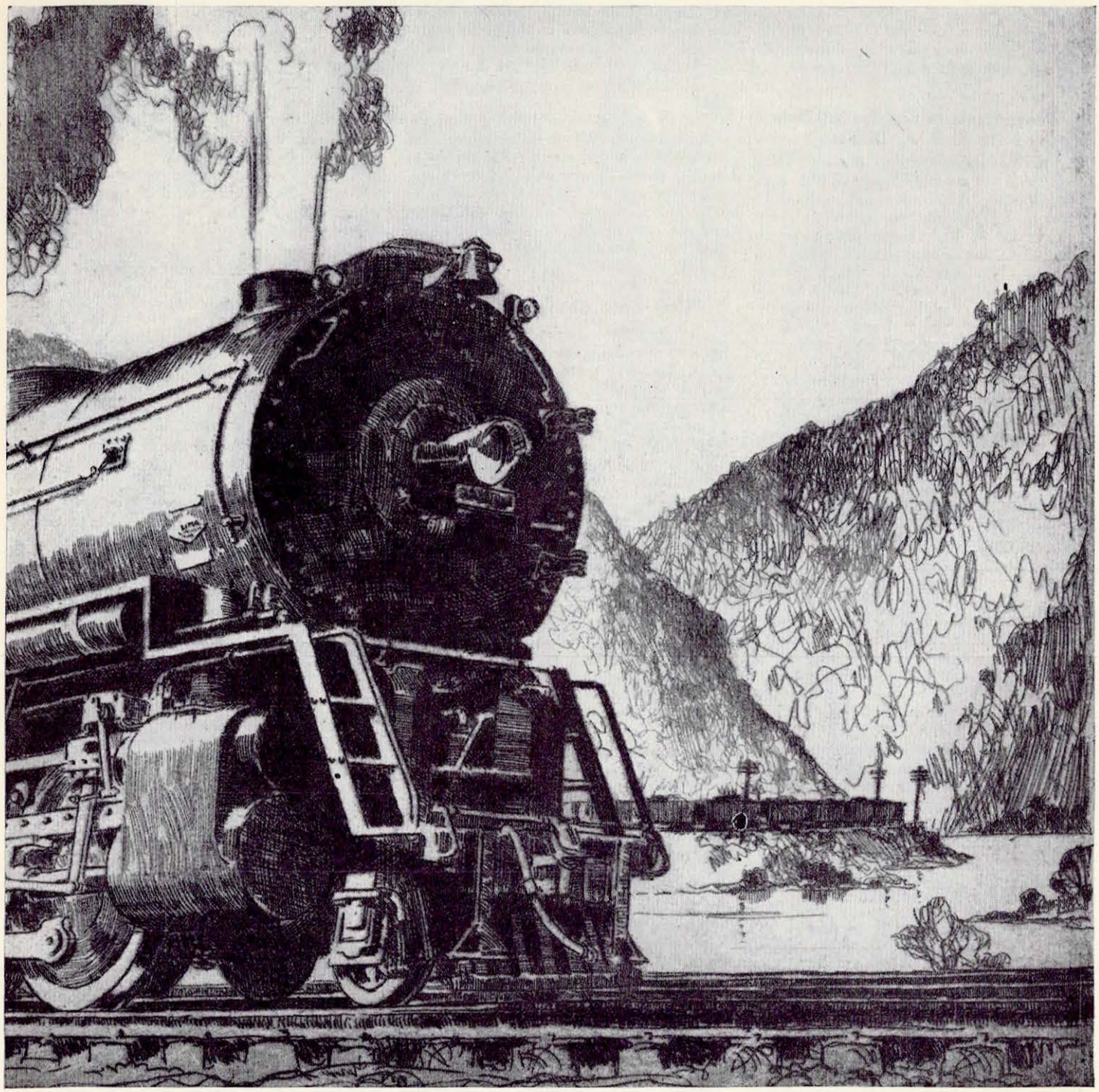

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evening, October 8, at Hotel Statler. A. J. Krueger, master car builder of the Nickel Plate, will speak on the progressive or spot system of repairs to freight cars.

Pennsylvania to Run Special Train to R. B. A. Dinner

For the convenience of those planning to attend the annual dinner of the Railway Business Association, to be held at the Hotel Stevens, Chicago, on Wednesday, November 4, the Pennsylvania has arranged to run a special train from New York to Chicago on the day preceding the meeting. The train, which will be operated as a section of the "Pennsylvania Limited," will leave New York (Pennsylvania station) at 2 p.m. and Newark (Market street) at 2:20, Tuesday, November 3, to arrive in Chicago (Union station) at 9 a.m. on the day of the dinner. As in 1929, the private cars of a number of P. R. R. officers will be attached to the train. The regular New York-Chicago fare will be charged.

N. & W. Names Four Freight Trains

Following a contest in which more than 6,000 titles were submitted by some 800 contestants, the Norfolk & Western has chosen names for four fast merchandise freight trains operated daily between the Midwest (Columbus, Ohio, and Cincinnati) and the Virginias and Carolinas, including the port of Norfolk, Va., on the Atlantic seaboard. The original train numbers, the new names, and the winning contestants are as follows: Eastbound, train No. 84—"The Skipper"—J. H. Hahn, machine shop foreman, Bluefield, W. Va.; train No. 86—"The Pilot"—T. F. Driscoll, stenographer, office of superintendent of terminals, Roanoke, Va.; Westbound, train No. 85—"The Nomad"—J. C. Johnson, chief clerk to general car inspector, Roanoke; train No. 87—"The Caravan"—E. L. Young, car repair man, Bluefield.

The Canadian Roads in August

Net revenues of the Canadian Pacific in August totaled $1,339,260, against $3,322,339 in August of 1930, a reduction of $1,983,078. In the same period expenses were cut $2,645,688. Gross for the month was $11,322,743, against $15,951,510, a reduction of $4,628,767.

For the eight months ended with August gross revenues were $93,704,191, a reduction of $22,664,411 from last year. Expenses in the eight-month period were cut $17,927,634, leaving the net for the eight months at $11,396,549, a reduction of $4,736,777 from the $16,133,326 reported in the like period of 1930.

Net operating revenue of $514,034 for the month of August, 1931, is shown by the monthly statement of gross revenues, operating expenses and net revenue of the Canadian National. Operating expenses for August show a decrease of $3,005,220, as compared with the figure for August, 1930.

Gross revenues in August, 1931, were $14,309,810, a decrease of $4,758,169 as compared with August, 1930. Operating expenses for the month were $13,795,775 as against $16,800,995 in the same month of last year. Net revenue for the month of August, 1931, was $514,034, a decrease of $1,752,948 from the net of August, 1930.

For the period from January 1 to the end of August, 1931, gross revenues were $117,392,910, a decrease of $30,736,610 as against the same period of 1930. Operating expenses for the 1931 period were $115,214,221, a decrease of $16,970,891 and net revenue $2,178,688, a decrease of $13,765,419 from the figure for the 1930 period.

Time Zone Changes Proposed

The Interstate Commerce Commission has announced an investigation to determine whether changes shall be made in its orders prescribing standard time zones affecting the state of Michigan and parts of adjacent states, as requested in petitions filed by the attorney general of Michigan and the Baltimore & Ohio and Pennsylvania. The Michigan legislature has enacted a law effective September 18 adopting standard Eastern time for the state, in conflict with the commission's orders. The Baltimore & Ohio wants to operate its line from Willard, Ohio, to Garrett, Ind., under Central time instead of Eastern time, and the Pennsylvania wants to operate its line from Fort Wayne, Ind., to Mackinaw City, Mich., under Eastern time instead of Central time. The proceeding is assigned for hearing at Detroit on October 15 before Commissioner Aitchison.

Southwest Shippers' Board

Shipments from the territory of the Southwest Shippers' Advisory Board will be 1.6 per cent less during the fourth quarter of 1931 than in the same quarter of 1930, according to commodity committee reports submitted at the meeting at Wichita Falls, Tex., on September 24. Four commodities showed anticipated increases in shipments—grain, 5 per cent; flour, meal and other mill products, 8 per cent; cotton, 25 per cent, and citrus fruits, 5 per cent. Decreases were anticipated in cottonseed and products, 10 per cent; coal and coke, 15 per cent; gravel, sand and stone, 5 per cent; lumber and forest products, 10 per cent; petroleum and products, 6 per cent; machinery and boilers, 5 per cent; cement, 15 per cent; brick and clay products, 15 per cent; lime and plaster, 25 per cent; agricultural implements and vehicles, 40 per cent; automobiles, trucks and parts, 25 per cent; chemicals and explosives, 10 per cent, and canned food products, 10 per cent.

New Cars in Service

The railroads in the first eight months of 1931 placed 9,655 new freight cars in service, according to the Car Service Division of the American Railway Association. In 1930 the total was 64,418, for eight months, and in 1929 it was 51,680. Of the new cars, 3,294 were box cars, 4,239 coal cars, 383 flat cars, 1,701 refrigerator cars, 30 stock cars and eight miscellaneous cars. The railroads on September 1 had 6,643 new freight cars on order, compared with 12,166 cars on the same day last year and 31,898 two years ago.

There were placed in service in the first eight months this year 103 new locomotives compared with 561 in the same period in 1930 and 474 in the same period in 1929. New locomotives on order on September 1 this year totaled 29 compared with 235 on the same day last year and 395 two years ago.

Shippers Estimate Reduced Traffic

Shippers of the country, through estimates just submitted to the Shippers' Regional Advisory Boards, anticipate that carload shipments of the 29 principal commodities in the fourth quarter of 1931 will be approximately 6,153,250 cars, a reduction of 7.6 per cent below the corresponding period in 1930.

It is estimated that of the 29 commodities, increase in transportation requirements will develop for seven, as follows: Cotton; cotton seed and products, except oil; citrus fruits; potatoes; live stock; sugar, syrup and molasses, and automobiles, trucks and parts. Commodities for which a decrease is estimated totaled 22, as follows: Grain; flour, meal and other mill products; hay, straw and alfalfa; other fresh fruits except citrus; other fresh vegetables except potatoes; coal and coke; poultry and dairy products; ore and concentrates; gravel, sand and stone; salt; lumber and forest products; petroleum and petroleum products; iron and steel; machinery and boilers; cement; lime and plaster; brick and clay products; agricultural implements and vehicles other than automobiles; paper, paperboard and prepared roofing; fertilizers; canned goods, and chemicals and explosives.

I. C. C. Practitioners Meet in Washington

The second annual meeting of the Association of Practitioners before the Interstate Commerce Commission was held at Washington on September 24 and 25. The membership of the association has increased in a year from 1,479 to 1,858. John J. Esch, former member of the commission, and president of the association, presided, and H. W. Bikle, general attorney of the Pennsylvania, was elected president for the ensuing year. In welcoming the members to Washington Chairman Ezra Brainerd, Jr., of the commission, said that the commission is greatly overworked and needs relief and urged the association to aid the commission in finding a proper solution for its difficulties.

"No member under existing conditions can long continue to do the work that his official duties require of him," he said. "It is physically impossible." With the great amount of important, complicated and delicate matters with which the commission is constantly called upon to deal, he added, it is not now possible for them to have adequate time for reflection and study, and the situation "is not at all

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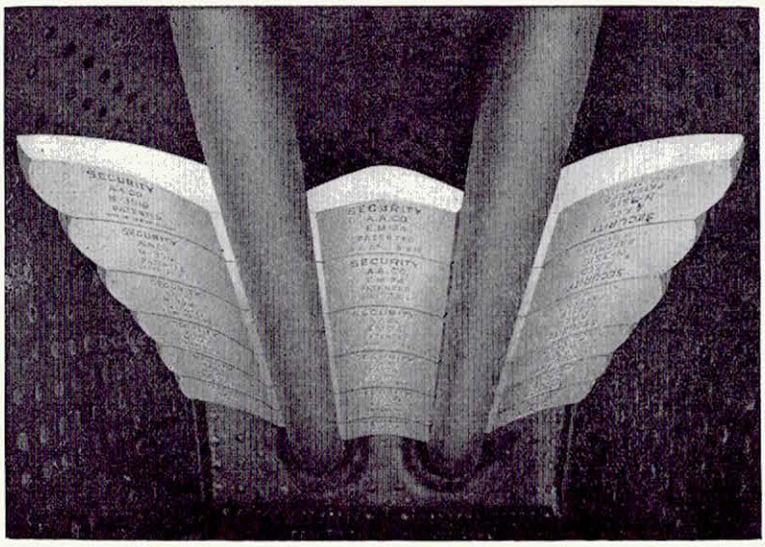

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conducive to the proper administration of justice."

Chairman Brainerd outlined the legislation which the commission has recommended to authorize it to delegate specified powers and duties to individual commissioners and employees but said that this has been opposed by many who object on principle to the delegation of powers, and as proposing a wholly inadequate remedy. Mr. Esch spoke on the same subject, also pointing out the large amount of investigation work that Congress turns over to the commission without providing for it in the appropriations. Commissioner Aitchison gave an informal talk on methods of railway regulation in England as he had observed them during a trip this summer, and Commissioner Eastman spoke briefly at the dinner on September 24.

Family Bargain Fares

Following the establishment of family bargain fares by the railroads in the Southwestern Passenger Association territory to points in Texas for September 25-26, as reported in the *Railway Age* of September 19, railroads operating from Chicago to the southwest offered combination reduced fares on the same day. The rates placed in effect by the southwestern carriers were fixed on a sliding scale, with the round-trip rate per person varying with the number of persons transported. During the summer (and continuing up to November 1), railroads operating from Chicago to St. Louis have had a round-trip rate of $12 in effect on Friday and Saturday of each week. Under these conditions, persons traveling to Texas on September 25-26, could purchase a round-trip ticket from Chicago to St. Louis for $12 and rebuy at St. Louis, and thus secure a lower rate than the prevailing rate via Kansas City or New Orleans. The through rates from Chicago to points in Texas on September 25-26, via St. Louis, or Kansas City and via New Orleans, were made equal to the rates from St. Louis to points in Texas plus $12.

N. & W. to Use Radio for Employees' Meeting

The program of the twelfth annual system efficiency meeting of the Norfolk & Western, which will be held at Roanoke, Va., on October 9, will be carried to at least 20,000 of the railroad's employees by an elaborate radio-telephone hook-up that will embrace the entire system. A similar hook-up was arranged for the efficiency meeting last year.

The feature of the meeting will be an address by Samuel O. Dunn, editor of the *Railway Age*. The hook-up of radio-telephone services, which will utilize 1,100 miles of N. & W. telephone wires, will center in the Roanoke City Auditorium. The program will be opened at 7:45 p.m.—half an hour before the broadcast starts—by J. B. Baskerville, general claim agent of the railroad and general chairman of the meeting. Following Mr. Dunn's address, the employees will hear W. J. Jenks, vice-president in charge of operation. A musical program also will be provided.

In addition to the night session, morning and afternoon sessions will be held in the ballroom of the Hotel Roanoke. At the morning meeting, addresses will be delivered by Col. W. S. Battle, Jr., vice-president in charge of valuation, real estate and public relations, and J. E. Crawford, general manager, and in the afternoon, by B. W. Herrman, vice-president in charge of traffic, and Joe Marshall, special representative of the American Railway Association.

The dates of local efficiency meetings along the railway have been changed to coincide with the date of the system meeting and employees at 20 points will attend their local meetings and participate in the system meeting by means of the hook-up. Amplifiers, loud speakers and controls will be installed at 21 N. & W. terminals. Employees unable to attend the local meetings can tune in on Station WDBJ and receive the entire program over the radio in their homes. Invitations to attend the local meetings have been issued by the railroad to members of civic clubs and chambers of commerce in the towns included in the hook-up.

Meetings & Conventions

The following list gives names of secretaries, date of next or regular meetings and places of meetings.

AIR BRAKE ASSOCIATION—T. L. Burton, Room 5605, Grand Central Terminal Building, New York City.

ALLIED RAILWAY SUPPLY ASSOCIATION.—F. W. Venton, Crane Company, 836 S. Michigan Blvd., Chicago. To meet with Air Brake Association, Car Department Officers Association, International Railroad Master Blacksmiths' Association, International Railway Fuel Association, International Railway General Foremen's Association, Master Boiler Makers Association and the Traveling Engineers' Association.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—W. R. Curtis, F. T. R., M. & O. R. R., Chicago, Ill.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 S. Michigan Ave., Chicago.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J. 143 Liberty St., New York. Next Convention, October 20-21, 1931, Edgewater Beach Hotel, Chicago.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—F. O. Whiteman, Room 800, 1017 Olive St., St. Louis, Mo. Next meeting, 1932, Detroit, Mich.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—F. R. Borger, C. I. & L. R. R., 836 Federal St., Chicago. Next convention, October 20-22, 1931, Congress Hotel, Chicago.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—Guy C. Hecker, 292 Madison Ave., New York.

AMERICAN RAILWAY ASSOCIATION.—H. J. Forster, 30 Vesey St., New York, N. Y.

Division I.—Operating.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Freight Station Section. — R. O. Wells, Freight Agent, Illinois Central Railroad. Chicago.

Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York.

Protective Section.—J. C. Caviston, 30 Vesey St., New York.

Safety Section.—J. C. Caviston, 30 Vesey St., New York.

Telegraph and Telephone Section.—W. A. Fairbanks, 30 Vesey St., New York.

Division II.—Transportation.—G. W. Covert, 59 East Van Buren St., Chicago.

Division III.—Traffic.—J. Gottschalk, 143 Liberty St., New York.

Division IV.—Engineering.—E. H. Fritch, 59 East Van Buren St., Chicago. Next meeting, March 15-17, 1932, Palmer House, Chicago. Exhibit by National Railway Appliances Association.

Construction and Maintenance Section.—E. H. Fritch. Next meeting, March 15-17, 1932, Palmer House, Chicago.

Electrical Section.—E. H. Fritch.

Signal Section.—R. H. C. Balliet, 30 Vesey St., New York.

Division V.—Mechanical.—V. R. Hawthorne, 59, East Van Buren St., Chicago.

Equipment Painting Section.—V. R. Hawthorne, 59 East Van Buren St., Chicago.

Division VI.—Purchases and Stores.—W. J. Farrell, 30 Vesey St., New York, N. Y.

Division VII.—Freight Claims.—Lewis Pilcher, 59 East Van Buren St., Chicago.

Division VIII.—Motor Transport.—George M. Campbell, 30 Vesey St., New York, N. Y.

Car Service Division.—C. A. Buch, 17th and H. Sts., N. W., Washington, D. C.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Next convention, October 18-20, 1932, Toronto, Ont. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION. —A. W. Large, Gen. Agri. Agt., C. R. I. & P. Ry., Chicago, Ill. Semi-annual meeting, December 3-4, 1931, Hotel Sherman, Chicago; annual meeting, June 15-17, 1932, Brown Hotel, Louisville, Ky.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—Works in co-operation with the American Railway Association, Division IV.—E. H. Fritch, 59 East Van Buren St., Chicago. Next meeting, March 15-17, 1932, Palmer House, Chicago. Exhibit by National Railway Appliances Association.

AMERICAN RAILWAY MAGAZINE EDITORS ASSOCIATION.—Miss E. Kramer, M-K-T Employes Magazine, St. Louis, Mo. Next convention, April, 1932, San Antonio, Tex.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C., M., St. P. & P. R. R., 11402 Calumet Ave., Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.—E. E. Caswell, Union Twist Drill Co., 11 S. Clinton St., Chicago.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—R. E. Schindler, Secretary, Union Trust Bldg., Washington, D. C.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Railroad Division, Paul D. Mallay, Johns-Manville Corp., 292 Madison Ave., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—H. L. Dawson, 1104 Chandler Building, Washington, D. C. Next meeting, January 26-28, 1932, Hotel Jefferson, St. Louis, Mo.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, District Claim Agent, Northern Pacific Ry., St. Paul, Minn. Annual convention, May, 1932, Louisville, Ky.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS. —Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Station, Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Stanley J. Strong, Transportation Building, Washington, D. C.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—S. A. Baber, High Grade Manufacturing Co., 10418 St. Clair Ave., Cleveland, Ohio. Meets with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—C. R. Crook, 2276 Wilson Ave., N. D. G., Montreal, Que. Regular meetings, 2nd Monday in each month, except June, July and August. Windsor Hotel, Montreal, Que.

CAR DEPARTMENT OFFICERS ASSOCIATION.—A. S. Sternberg, M. C. B. Belt Ry. of Chicago, 7926 South Morgan Street, Chicago.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—G. K. Oliver, 2514 W. 55th St., Chicago. Regular meetings, 2nd Monday in month, except June, July, and August, Great Northern Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.—J. W. Krause, Room 299, 610 So. Main St., Los Angeles, Cal. Regular meetings, 2nd Monday of each month, except July, August and September, Room 299, 610 So. Main St., Los Angeles.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, Mo. —F. G. Wiegman, 720 N. 23rd St., East St. Louis, Ill. Meetings first Tuesday of each month, except July and August, American Hotel Annex, 6th and Market Sts., St. Louis, Mo.

CENTRAL RAILWAY CLUB OF BUFFALO.—T. J. O'Donnell, 1817 Hotel Statler, McKinley Square, Buffalo, N. Y. Regular meetings, 2nd Thursday each month, except June, July, August, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—D. R. Boyd, 453 E. 6th St., Cincinnati, Ohio. Meetings 2nd Tuesday in February, May, September and November, Hotel Gibson, Cincinnati, O.

CLEVELAND RAILWAY CLUB.—F. L. Frericks, 14416 Alder Ave., Cleveland, Ohio. Meetings, second Monday each month, except June, July, August, Auditorium, Brotherhood of Railroad Trainmen's Building, West 9th St., and Superior Ave., Cleveland.

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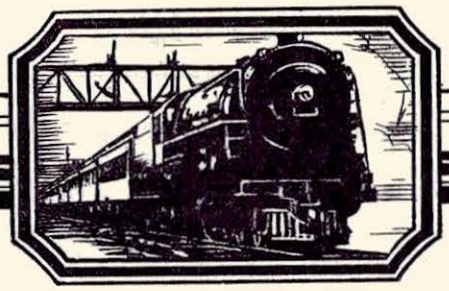


Alco Alco

TO ECONOMIZE— MODERNIZE

"Will the railroads continue to allow the proportion of new locomotives to decrease, while the designers continue to pile up improvements adapted to meet conditions which the railroads are facing in acute form today?

When the demands of a rapidly increasing traffic were constantly forcing the railroads to provide additional facilities, the value of a locomotive was measured in terms of the gross revenue which would be lost were it not available. Today the value of a new locomotive is measured in terms of its ability to perform more cheaply and more effectively a service already provided for. Its determination involves measuring the obsolescence of the old. A negative attitude toward obsolescence must be replaced by a positive attitude—one which places the burden of proof on the old locomotives and constantly subjects their performance to a critical examination in view of the possibilities offered by current developments in locomotive design. Only in this way will the active locomotives of tomorrow be fitted to provide the quality of service demanded by the public at a cost satisfactory to the railroads."

From an editorial in the Railway Age
June 20th, 1931

American Locomotive Company
30 Church Street New York N.Y.

Alco Alco

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich.

INTERNATIONAL RAILWAY CONGRESS. Cairo, Egypt, January 10-16, 1933.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. T. Winkless, Room 700 La Salle Street Station, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabasha St., Winona, Minn.

MASTER BOILER MAKERS ASSOCIATION.—A. F. Stiglmeier, 29 Parkwood St., Albany, N. Y.

MASTER CAR BUILDERS' AND SUPERVISORS' ASSOCIATION.—(See Car Department Officers Association.)

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—James B. Walker, 270 Madison Ave., New York. Annual convention, October 20-23, 1931, Jefferson Hotel, Richmond, Va.

NATIONAL ASSOCIATION OF RAILROAD TIE PRODUCERS.—Roy. M. Edmonds, 1252 Syndicate Trust Bldg., St. Louis, Mo.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 1014 South Michigan Ave., Chicago. Exhibit at A. R. E. A. convention.

NATIONAL SAFETY COUNCIL. Steam Railroad Section: J. L. Walsh, Supt. Safety, M.-K.-T. R. R., Dallas, Tex. Annual congress October 12-16, 1931, Hotel Stevens, Chicago.

NEW ENGLAND RAILROAD CLUB. W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2nd Tuesday in month, except June, July, August and September, Copley Plaza Hotel, Boston, Mass.

NEW YORK RAILROAD CLUB.—D. I. McKay, 26 Cortlandt St., New York. Regular meetings, 3rd Friday in month, except June, July and August, 29 W. 39th St., New York City.

PACIFIC RAILWAY CLUB. W. S. Wollner, P. O. Box, 3275, San Francisco, Cal. Regular meetings 2nd Thursday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1124 Woodward Building, Washington, D. C. Next convention, 1932, Buffalo, N. Y.

RAILWAY BUSINESS ASSOCIATION. Frank W. Noxon, 1112 Shoreham Building, Washington, D. C. Next meeting, November 4, 1931, Hotel Stevens, Chicago.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 1841 Oliver Building, Pittsburgh, Pa., Regular meetings, 4th Thursday in each month except June, July and August. Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—Edward Wray, 9 S. Clinton St., Chicago. Meets with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. P. Hackett, Baltimore & Ohio R. R. Baltimore, Md.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division, Purchases and Stores Division and Motor Transport Division, American Railway Association.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York. Meets with Telegraph and Telephone Section of A. R. A. Division 1.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION. — T. F. Donahoe, Gen. Supvr. Road, Baltimore & Ohio, Pittsburgh, Pa. Next convention, September 20-22, 1932, Hotel Stevens, Chicago. Exhibit by Track Supply Association.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal Drawer 24, M. P. O., St. Louis, Mo. Regular meetings, 2nd Friday in month, except June July and August. Statler Hotel, St. Louis.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, West Nyack (Rockland Co.), N. Y. Meets with A. R. A. Signal Section.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3rd Thursday in January, March, May, July, September and November. Ansley Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—R. G. Parks, A. B. & C. Ry., Atlanta, Ga.

SUPPLY MEN'S ASSOCIATION.—E. H. Hancock, Treasurer, Louisville Varnish Co., Louisville, Ky. Meets with A. R. A. Div. V. Equipment Painting Section.

TORONTO RAILWAY CLUB.—J. A. Murphy, 1405 Canadian National Express Building, Toronto. Regular meetings 3rd Monday of each month, except June, July and August, Royal York Hotel, Toronto, Ont.

TRACK SUPPLY ASSOCIATION.—L. C. Ryan, Oxweld Railroad Service Co., Carbon & Carbide Building, Chicago. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION. — W. O. Thompson, 1177 East 98th St., Cleveland, O.

WESTERN RAILWAY CLUB.—J. H. Nash, Dri-Steam Valve Sales Corp., 122 S. Michigan Ave., Chicago. Regular meetings 3rd Monday each month, except June, July, August and September, Hotel Sherman, Chicago.

Foreign

Co-ordination Brings Better Freight Service in Great Britain

As a further sign of the increasing co-ordination between the railway and road sections of individual British railroads, the Southern has recently announced a railhead distribution scheme, which provides for the collection and delivery of all descriptions of freight, according to a report received in the Department of Commerce. Under the new plan, a shipper can send his merchandise in full carloads by express freight trains at low rates and at their destination have them stored for short or long periods and delivered to local customers by railway motor trucks as the sender instructs.

The advantages of such a plan, whereby a consignment in bulk can be split up at the termination of the journey into various packages for a number of consignees, are obvious. This delivery in small lots is available within a 10-mile radius of selected stations and is applicable for every type of freight. A small extra charge is made in the case of coal, coke, bricks and materials requiring extra handling.

The use of the "container system" also plays a large part in the company's freight service. The Southern has at the present time five types of container with carrying capacities varying from 2½ to 4 tons and a commensurate equipment of hoists and cranes to handle these containers. Once a container has been loaded by the trader, it is brought into the station on the railway company's specially fitted motor truck and is then transferred by derrick in one operation to the railway car where it is readily fastened down for any length of journey. At the receiving station it is craned on to another road vehicle and delivery is effected immediately, the contents remaining undisturbed from the time of stowage to the moment the container is opened by the consignee.

PROTECTIVE COATINGS.—Armco Engineering Bulletin No. 4, Vol. 1, is devoted to protective coatings for Spiral Welded Pipe. Six different protective coverings are described and data given on the service they render, with suggestions as to type of service for which each is best adapted. There are six pages of text matter and one chart.

STORAGE BATTERY LOCOMOTIVES.—"The Storage Battery Switching Locomotive," just issued by the Electric Storage Battery Company, Philadelphia, Pa., gives illustrations and details of the construction and advantages of various types and sizes of storage battery locomotives for industrial plant and railway switching service. The straight storage battery locomotive, the combination battery-trolley locomotive, and the battery-oil-electric locomotive are the three classifications into which this unit of equipment is divided.

Equipment and Supplies

LOCOMOTIVES

THE PENNSYLVANIA has placed orders for the construction of the chassis and mechanical parts for 60 electric freight locomotives, constituting part of the equipment to be used when electrification is completed between New York and Washington. The locomotive parts included in contracts just let consist of driving wheels, axles, trucks, frames and cab ends and the structural parts in which the electrical apparatus will be installed. Of the 60 just ordered, 30 will be built by the Lima Locomotive Works, 20 by the Westinghouse Electric & Manufacturing Company, and 10 by the Pennsylvania shops at Altoona, Pa. This is part of the order for 150 electric locomotives let to the Westinghouse Electric & Manufacturing Company and the General Electric Company, as reported in the *Railway Age* of May 30. Construction schedules call for the delivery of the 60 locomotives to begin early in March, 1932. It is expected that the entire 150 freight and passenger locomotives will be ready for operation in 1933, at which time it is also expected that the actual work of electrifying the main line tracks will be completed. The railroad's program calls for the purchase of 80 additional electric locomotives. The 60 locomotives just ordered are known as Class L-6A, are heavy-duty, high-speed freight engines, 51 ft. 10 in. in length, and weighing 330,000 lb. The locomotives will have four pairs of 62-in. driving wheels, one motor to each pair, and a two-wheeled truck at each end.

FREIGHT CARS

THE TEXAS COMPANY is inquiring for 48 gondola cars of 50 tons' capacity.

THE ST. LOUIS-SAN FRANCISCO is inquiring for five freight car underframes.

THE CHESAPEAKE & OHIO has inquired of freight car manufacturers for 1,2 tons of fabricated steel for freight repairs, to be delivered during th quarter of this year.

THE PACIFIC FRUIT EXPRESS correctly reported in the *Railway A* tember 12 as having ordered s underframes from the Consol Corporation, Los Angeles, former company ordered 520 side and endframes for maint of which 250 sets were ord latter company.

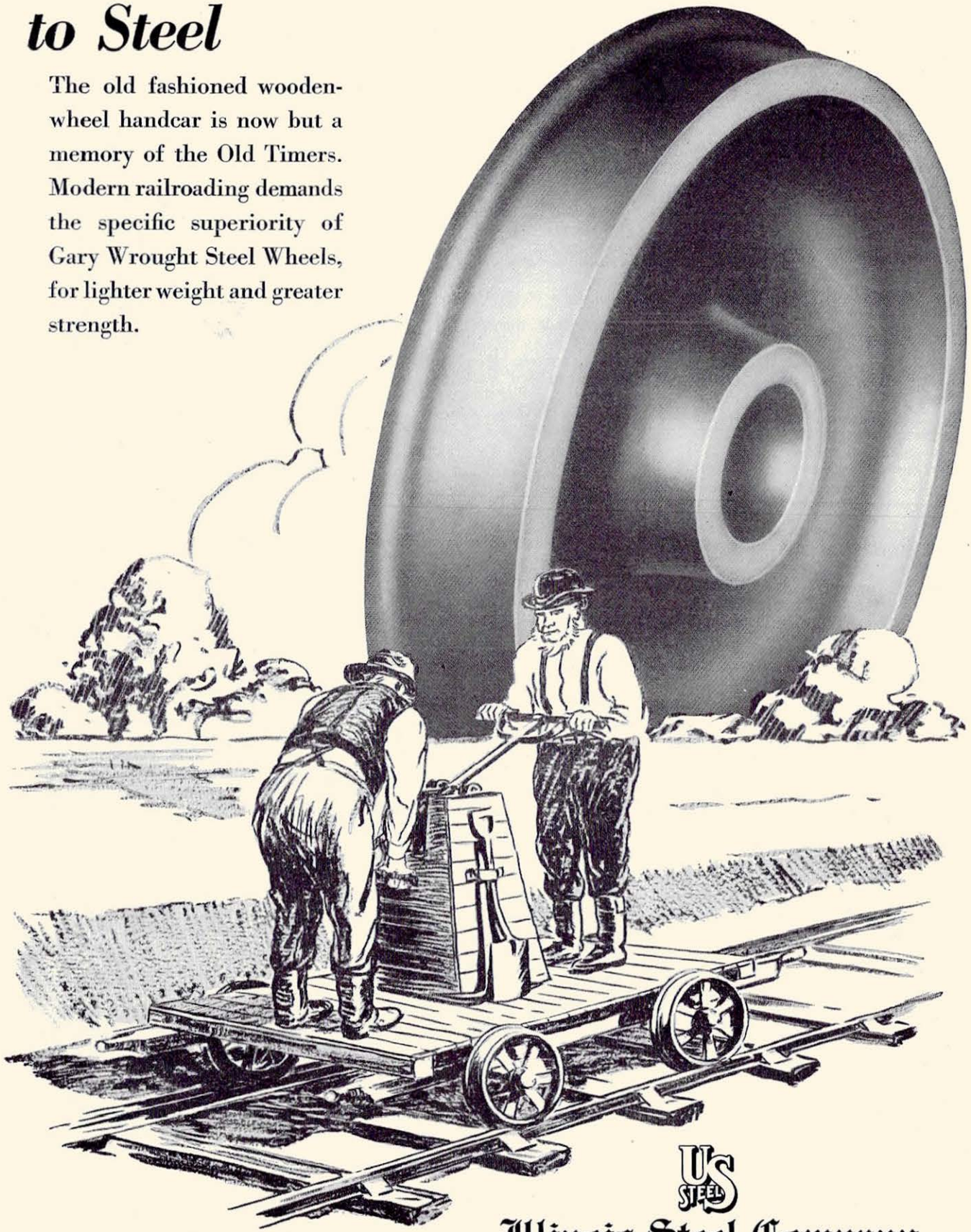
PASSENGER C

THE BOARD OF TRANSP OF NEW YORK, has receive passenger cars for subwa which it has been inquirin in the *Railway Age* of

Continued on Next

From Wood to Steel

The old fashioned wooden-wheel handcar is now but a memory of the Old Timers. Modern railroading demands the specific superiority of Gary Wrought Steel Wheels, for lighter weight and greater strength.



U S STEEL

Illinois Steel Company

Subsidiary of United States Steel Corporation

General Offices: 208 South La Salle Street, Chicago

Bids were taken on from 300 to 1,500 cars and the American Car & Foundry Company was the low bidder. It is expected that 500 cars will be awarded to the American Car & Foundry Company at a cost of about $10,531,500. This does not include a cost of about $3,662,500 for electrical equipment, which will be purchased separately.

IRON & STEEL

THE DELAWARE & HUDSON is inquiring for about 8,000 tons of 130-lb. rail.

THE ATCHISON, TOPEKA & SANTA FE is expected to enter the market for 60,000 tons of rails within the next few weeks.

THE MISSOURI PACIFIC is inquiring for 500 tons of structural steel for miscellaneous bridge work.

THE PERE MARQUETTE has ordered 300 tons of structural steel for grade crossing separation work in Wayne, Mich., from the American Bridge Company.

THE CHESAPEAKE & OHIO has ordered 45,000 tons of rails, placing 19,000 tons with the Illinois Steel Company; 15,000 tons with the Inland Steel Company; 7,000 tons with the Bethlehem Steel Company, and 4,000 tons with the Carnegie Steel Company.

THE NEW ORLEANS PUBLIC BELT has ordered 21,000 tons of structural steel from the American Bridge Company and 39,000 tons from the McClintic-Marshall Corporation for a combination railroad and highway bridge over the Mississippi river just above the New Orleans city limits.

SIGNALING

THE BOARD OF TRANSPORTATION, CITY OF NEW YORK, has received bids for block signaling and interlocking equipment for the Bronx line of the new subway system, from One Hundred and Forty-first street and St. Nicholas avenue to Two Hundred and Fifth street, Webster avenue. Two bids were received, as follows: General Railway Signal Company, $2,317,800, and Union Switch & Signal Company, $2,395,000.

DRAFT GEAR PRODUCTION.—A 24-page booklet entitled "Miner Draft Gear Production" has been recently published by W. H. Miner, Inc., the Rookery, Chicago. This booklet, generously illustrated, gives an excellent general idea of most of the important operations in the manufacture of Miner friction draft gears from the selection of pig iron and scrap in the storage yards to casting the cylinders and friction elements, manufacturing and testing springs and assembling the complete gears. This booklet is of more than ordinary interest because it shows how thoroughly scientific research has been coordinated with service performance and experience covering a 37-year period to produce the friction draft gears made by this well-known company.

Supply Trade

N. L. Howard, chairman of the board of the **North American Car Corporation,** has been elected president to succeed **Irwin R. Brigham,** who becomes less active.

Edward S. Sullivan, assistant coast agent of the **St. Louis Car Company,** has been promoted to coast agent, with headquarters at San Francisco, Cal., to succeed **Gus Koch,** deceased.

The Independent Pneumatic Tool Company, Chicago, has moved its Birmingham, Ala., office from the Comer building to 915 North Seventh avenue, where it now has warehouse facilities. **H. F. Halbert** is manager.

Lowell R. Burch, chairman of the executive committee of the board of directors of the **New York Air Brake Company,** New York, has been elected also president of the company. He succeeds **B. B. Greer,** who has resigned as president and as a director.

The central district office of the **Massey Concrete Products Corporation** has been transferred from the Dixie Terminal building, Cincinnati, Ohio, to 908 Midland Bank building, Cleveland. **W. Lyle McDaniel** is resident manager of that district.

Charles H. Gayetty is now with the **Keasbey & Mattison Company,** Ambler, Pa., as manager of railway sales. In the *Railway Age* of September 26 it was incorrectly reported that Mr. Gayetty was a sales representative of the Louisville Frog, Switch & Signal Company, Louisville, Ky.

Lewis E. Porter, vice-president of **S. F. Bowser & Co.,** Indianapolis, Ind., has been appointed vice-president and general manager of **S. F. Bowser & Co., Ltd.,** Toronto, Ont. **T. D. Kingsley,** vice-president in charge of eastern sales, with headquarters at New York, has resigned.

Harry C. Beaver, vice-president of the **Worthington Pump & Machinery Corporation,** New York, has been elected president, succeeding **LaMonte J. Belnap,** who has been elected chairman of the executive committee. A photograph of Mr. Beaver and a sketch of his career were published in the *Railway Age* of February 21, 1931, page 428.

Walter H. Gardner, advertising manager of the **Caterpillar Tractor Company,** Peoria, Ill., has been appointed manager of the newly-created Specialty Sales division. Mr. Gardner will direct the company's activities in promoting sales to railroads and public utilities, as well as to market Caterpillar engines and sub-assemblies to other manufacturers. **G. M. Walker** has been appointed advertising manager to succeed Mr. Gardner.

A. R. Whitehorn, assistant commercial engineer of the **General Railway Signal Company,** Rochester, N. Y., has been promoted to commercial engineer. He first entered railway service in 1908 in bridge construction work on the Chicago & North Western. In 1909 he served as leverman on the Union Pa-

A. R. Whitehorn

cific, and in 1912 entered signal construction work on the Chicago, Burlington & Quincy. In July, 1917, he resigned from the Burlington and took a position in the Illinois Central signal department. In 1927 he resigned this place to become signal engineer with the E. A. Lundy Company at Chicago. The following year he entered the service of the L. S. Brach Manufacturing Corporation as resident manager at Chicago. In August, 1929, he resigned this position and has been with the General Railway Signal Company since.

S. N. Wight, commercial engineer of the **General Railway Signal Company,** Rochester, N. Y., has been promoted to engineer of train operation. Mr. Wight was born on March 21, 1879, at Andover, Ohio. He was graduated from Andover

S. N. Wight

High school in 1897 and entered Hiram College the following year. He entered the employ of the Lake Shore & Michigan Southern (now part of the New York Central), in 1903, and from September, 1905, to April, 1910, was signal

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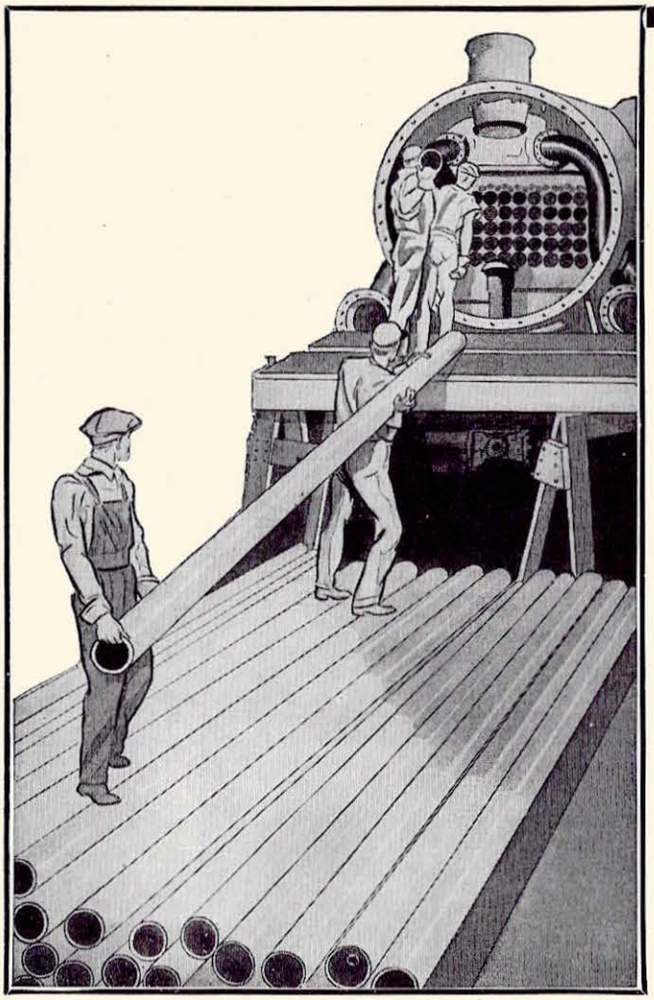

How TONCAN IRON cures tube troubles

CORROSION is one of the worst enemies of boiler tubes. To combat it, Toncan Iron fortifies the natural corrosion resistance of refined iron by alloying with copper and molybdenum.

■ By making Toncan Iron boiler tubes seamless, another cause of tube trouble is eliminated.

■ Many a leaky tube gets its start from the weakened condition in which cold working leaves ordinary tube metal. But Toncan Iron is unaffected by cold working.

■ Thus, Toncan Iron boiler tubes overcome three major causes of boiler tube replacement, thereby keeping maintenance in check.

REG. U. S. PAT. OFF.
TONCAN
COPPER
Mo-lyb-den-um
IRON

The Birdsboro Steel Foundry & Machine Company of Birdsboro, Penna., has manufactured and is prepared to supply under Toncan license, copper-molybdenum castings for the locomotive.

REPUBLIC STEEL CORPORATION
General Offices: Youngstown, Ohio

inspector. He entered the employ of the General Railway Signal Company in 1910 and since October 1, 1911, has been commercial engineer. During Mr. Wight's service with the G-R-S Company he has invented two outstanding systems; namely, the absolute permissive block system and the centralized traffic control system.

R. C. Todd, assistant general sales manager of the **American Rolling Mill Company,** Middletown, Ohio, has been promoted to assistant vice-president and will engage in special work in connection with the company's sales activities. **H. M. Richards,** manager of the Cleveland sales district, with headquarters at Cleveland, has been appointed assistant general manager of sales to succeed Mr. Todd, while **Foster E. Wortley,** assistant district manager of the Pittsburgh office, succeeds Mr. Richards. **O. L. Conley** has been appointed assistant manager of the Cleveland district.

OBITUARY

Charles B. Semple, president of W. & A. C. Semple, Inc., Louisville, Ky., died on September 21 of heart failure.

Gus Koch, coast agent of the St. Louis Car Company, with headquarters at San Francisco, Cal., died on September 19, of injuries resulting from an automobile accident on September 17. He was born on September 24, 1850, and has represented the St. Louis Car Company for over 35 years.

Clemuel Ricketts Woodin, director and member of the executive committee of the American Car & Foundry Company, of which company his son, William Hartman Woodin, is president, died at his home at Berwick, Pa., on September 25. C. R. Woodin was born on December 26, 1844, at Cambra, Luzerne County, Pa. He attended Kingston (Pa.) seminary until he was 16 years of age, when he entered the employ of Jackson & Woodin at Berwick, of which firm his father was a partner. Since entering that service, Mr. Woodin has been continuously connected with the railway equipment industry, except for a period of military service during the Civil war, as a member of Company C, 28th Regiment, Pennsylvania Emergency Reserves. He was a pioneer in the railway equipment industry and a contemporary of Commodore Vanderbilt of the the New York Central, Samuel Sloane of the Lackawanna and many others prominent in developing the large railway systems of the country. The firm of Jackson & Woodin, with which he began work, was first engaged in the manufacture of plows, stoves, iron pipe and other foundry products. In 1861 the business was extended to include the building of small cars for use in limestone quarries and later of railroad cars and mine cars; by 1869 the firm was established as an important member of the railway supply industry. In 1872 the Jackson & Woodin Manufacturing Company was organized, with C. R. Woodin as president, which position he held for 20 years until he retired from active service on account of ill health. In 1899, when the American Car & Foundry Company was formed, the Jackson & Woodin Manufacturing Company was absorbed in the consolidation. Shortly thereafter, Mr. Woodin was elected to its board of directors, and in 1906 was chosen a member of its executive committee, which offices he held at the time of his death. He was also a director of the American Car & Foundry Securities Corporation.

TRADE PUBLICATION

HYDRAULIC TABLES AND OTHER DATA.—The Baldwin-Southwark Corporation, Philadelphia, Pa., has recently issued Bulletin No. 25, containing 32 pages, which is devoted exclusively to the presentation of practical information and data for the use of engineers engaged in the design or use of hydraulic equipment. Tables giving the quantity of water passed through 100-ft. lengths of clean steel pipe under various pressure differentials are said to be the first ever to present such information in printed form. The bulletin also contains data on plunger displacements, wire and sheet metal gages, the properties of bolts, specific gravities and weights, strength of materials, properties of various sections, beam formulas and moments of inertia of rectangles.

* * *

Courtesy Southern News Bulletin

A reproduction of an illustrated poster recently gotten out by H. W. Moseley, conductor in charge of local freight trains Nos. 61 and 62, operating between Richmond, Va., and Keysville, on the Richmond division of the Southern. It is interesting not only as an example of employee co-operation but also is an unusually helpful piece of railroad publicity.

Construction

CHICAGO & NORTH WESTERN—CHICAGO, BURLINGTON & QUINCY.—Examiners A. C. Hanson and R. R. Molster of the Interstate Commerce Commission, in a proposed report, have recommended that the commission dismiss a complaint filed by the Public Service Commission of Wyoming asking the commission to require these companies or either of them to construct a connecting line between Bonneville, Wyo., and Shoshoni, 2.5 miles, and a branch line through the U. S. Reclamation Service Riverton project to Pavillion, Wyo., about 30 miles. They recommend a finding that the construction is not required by public convenience and necessity.

DELAWARE & HUDSON.—The Public Service Commission of New York has approved as not excessive a bid submitted by Spellman & Oliver, Chateaugay, N. Y., for work covering the elimination of the Willsboro and Jacobs crossings of this company's tracks in Willsboro, N. Y.

Financial

BALTIMORE & OHIO.—*Reduces Common Dividend.*—The directors of this company, who, in March last, reduced the quarterly dividend on common stock from 1¼ per cent to 1¼ per cent, have made a further reduction to a quarterly basis of 1 per cent, payable December 1 to stockholders of record October 10.

BALTIMORE & OHIO.—*Acquisition.*—Three short lines connecting with the Chicago & Alton—the Kansas & Sidell, the Casey & Kansas and the Yale Short Line—have asked the Interstate Commerce Commission for a hearing for the purpose of fixing their commercial value and for an order directing the B. & O. to acquire their properties in connection with its acquisition of the properties of the Chicago & Alton.

BALTIMORE & OHIO.—*Control of Short Line.*—The Interstate Commerce Commission has authorized this company to acquire control, by purchase of capital stock and under an operating agreement, of the Mount Jewett, Kinzua & Riterville. The latter company is to acquire that part of the Kushequa Railroad extending from a connection with its line at Kushequa, Pa., to certain industries. The Kushequa is authorized to abandon that part of its line extending from Kushequa to McKeans, 6.8 miles; the Smethport Railroad of its line from McKeans to East Smethport, 8.5 miles; the Buffalo, Bradford & Kane of its line in Smethport, 0.9 miles; the Keating & Smethport of its 0.2-mile line in that municipality; the Kane Railroad of its 0.3-mile line in Mount Jewett; the Mead Run Railroad of its line extending 2.8 miles from Mount Jewett to Evano; and the Mount Jewett, Kinzua & Riterville is authorized to abandon operation of these lines.

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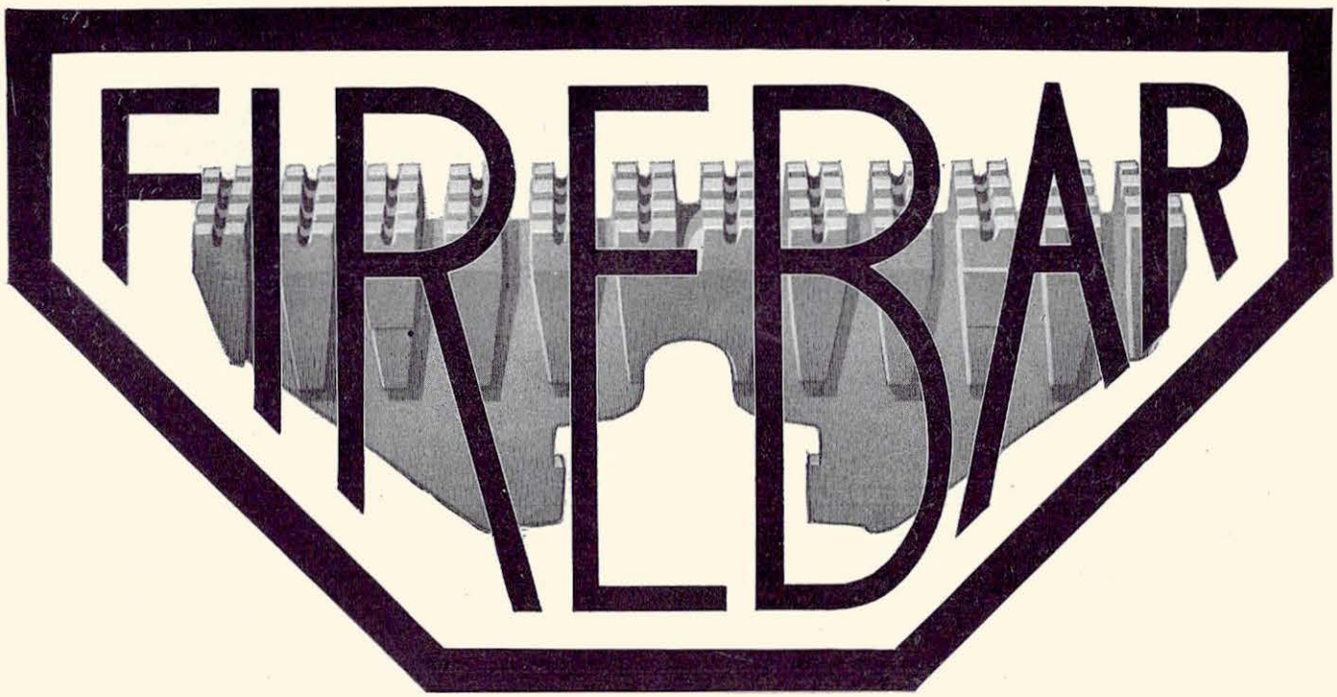

BETTER FIRES

FIREBAR CORPORATION
CLEVELAND OHIO.

CHICAGO & NORTH WESTERN.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue and pledge as collateral for short-term notes $8,380,000 of general mortgage 4½ per cent bonds and $16,456,000 of first and refunding mortgage bonds, to reimburse the treasury for capital expenditures and provide funds to meet cash requirements during the next year.

CHICAGO GREAT WESTERN.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to lease the railroad facilities of the St. Paul Union Stock Yards Company and the St. Paul Bridge & Terminal Railway, 42.2 miles.

EAST JORDAN & SOUTHERN.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from East Jordan, Mich., to Bellaire, 18.6 miles.

LEHIGH VALLEY.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire one-half of the stock of the Owasco River, a terminal line at Auburn, N. Y., from the New York Central for $45,385.

LOUISIANA & ARKANSAS.—*Note.*—This company has applied to the Interstate Commerce Commission for authority to renew from time to time a promissory note for $1,700,000 to the Chase National Bank and to pledge as collateral $2,766,000 of first mortgage 5 per cent bonds.

ST. LOUIS-SAN FRANCISCO.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue and pledge $2,454,000 of prior lien mortgage 6 per cent bonds, $532,000 of refunding mortgage 4 per cent bonds, and $4,014,000 of consolidated mortgage 6 per cent bonds, Series B, to be pledged as collateral for short-term notes, and to issue $4,014,000 of Series C bonds in conversion of the Series B bonds.

WEST VIRGINIA MIDLAND.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon as to interstate commerce its line from Holly Junction, W. Va., to Diana, 16.9 miles, leaving the line to be operated as an industrial line.

Average Prices of Stocks and of Bonds

	Sept. 29	Last week	Last year
Average price of 20 representative railway stocks.	47.02	47.41	104.41
Average price of 20 representative railway bonds..	79.18	81.29	96.18

Dividends Declared

Carolina, Clinchfield & Ohio.—$1.00, quarterly, payable October 10 to holders of record September 30; Stamped Certificates, $1.25, quarterly, payable October 11 to holders of record September 30.

Delaware, Lackawanna & Western.—$.50, quarterly, payable October 20 to holders of record October 3.

Northern Pacific.—Common, $.75, quarterly, payable November 2 to holders of record October 5.

Pere Marquette.—Preferred and Prior Preference dividends omitted.

Reading Company.—Common, $1.00, quarterly, payable November 12 to holders of record October 15.

Railway Officers

EXECUTIVE

Bracken Succeeds Spens on Burlington

Edward P. Bracken, vice-president in charge of operation of the Chicago, Burlington & Quincy, has been elected executive vice-president of the Burlington System, which includes the Colorado & Southern and the Ft. Worth & Denver City, to succeed Conrad E. Spens, whose death was noted in the *Railway Age* for August 22. Mr Bracken's headquarters are at Chicago. Edward Flynn, general manager of the Burlington Lines West of the Missouri river, with headquarters at Omaha, Neb., succeeds Mr. Bracken as vice-president in charge of operation, at Chicago. James H. Aydelott, general manager of the Ft. Worth & Denver City and the Wichita Valley, with headquarters at Ft. Worth, Tex., has been appointed general manager of the Burlington, Lines West of the Missouri river, with headquarters at Omaha, Neb., succeeding Mr. Flynn. J. D. Farrington, general superintendent of the Central district of the Burlington, with headquarters at Burlington, Iowa, has been appointed general manager of the Ft. Worth & Denver City and the Wichita Valley, with headquarters at Ft. Worth, to succeed Mr. Aydelott. J. C. Grisinger, superintendent of the Casper division, with headquarters at Casper, Wyo., has been promoted to general superintendent of the Central district, with headquarters at Burlington, to succeed Mr. Farrington. F. Cone, superintendent of the Sheridan division, with headquarters at Sheridan, Wyo., has been transfered to Casper, to succeed Mr. Grisinger. The jurisdiction of H. C. Murphy, superintendent of the Alliance division, with headquarters at Alliance, Neb., has been extended to include the Sheridan division.

Mr. Bracken has been associated with the Burlington for more than 44 years. He first entered the service of this road in August, 1887, as a gang foreman on the Lincoln division, being appointed extra gang foreman on the Wymore division in September, 1888. A year later, he was appointed track foreman, and after serving in this position for a year he was promoted to roadmaster, in which capacity he remained for 13 years. At the end of this period he became trainmaster, and in November, 1905, he was advanced to assistant superintendent of the Lincoln division. A year later, Mr. Bracken was further advanced to superintendent and served successively in this capacity on the Lincoln, Sterling, Sheridan, Brookfield and Galesburg divisions. He was promoted to general superintendent of the Wyoming division on May 15, 1909, and on February 1, 1910, was further advanced to the position of assistant general manager of the Lines East of the Missouri river, with headquarters at Chicago. He was promoted to general manager of the Lines East in August, 1912, and five years later, he was elected vice-president in charge of operation. On August 9, 1918, during government control, Mr. Bracken was appointed general manager of the Burlington, and on November 6, 1919, he was appointed federal manager. On the termination of government control in 1920, he was re-appointed

Edward P. Bracken

vice-president in charge of operation, which position he held until his recent appointment, effective September 24.

Mr. Flynn has been in the service of the Burlington for about 34 years. He was born on May 19, 1873, at Bement, Ill., and after short terms of service with the Chicago & Eastern Illinois, the Wabash and the Southern Pacific went with the Burlington in 1897 as a brakeman. He was promoted to conductor in 1900 and six years later he was again promoted to trainmaster at Omaha, Neb., in which position he served until 1908, when he was further advanced to assistant superintendent at Lincoln, Neb.

Edward Flynn

A year later he was promoted to superintendent at Omaha, later being transferred to McCook, Neb., and thence to La Crosse, Wis. In June, 1917, Mr. Flynn was transferred to Chicago, where he remained until April, 1918, when he was promoted to general superintendent of the Nebraska district, with headquarters at Lincoln. He held this position

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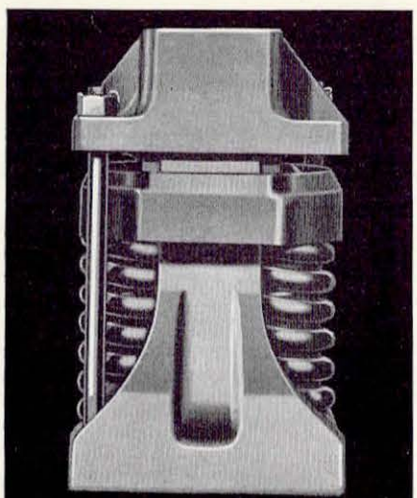

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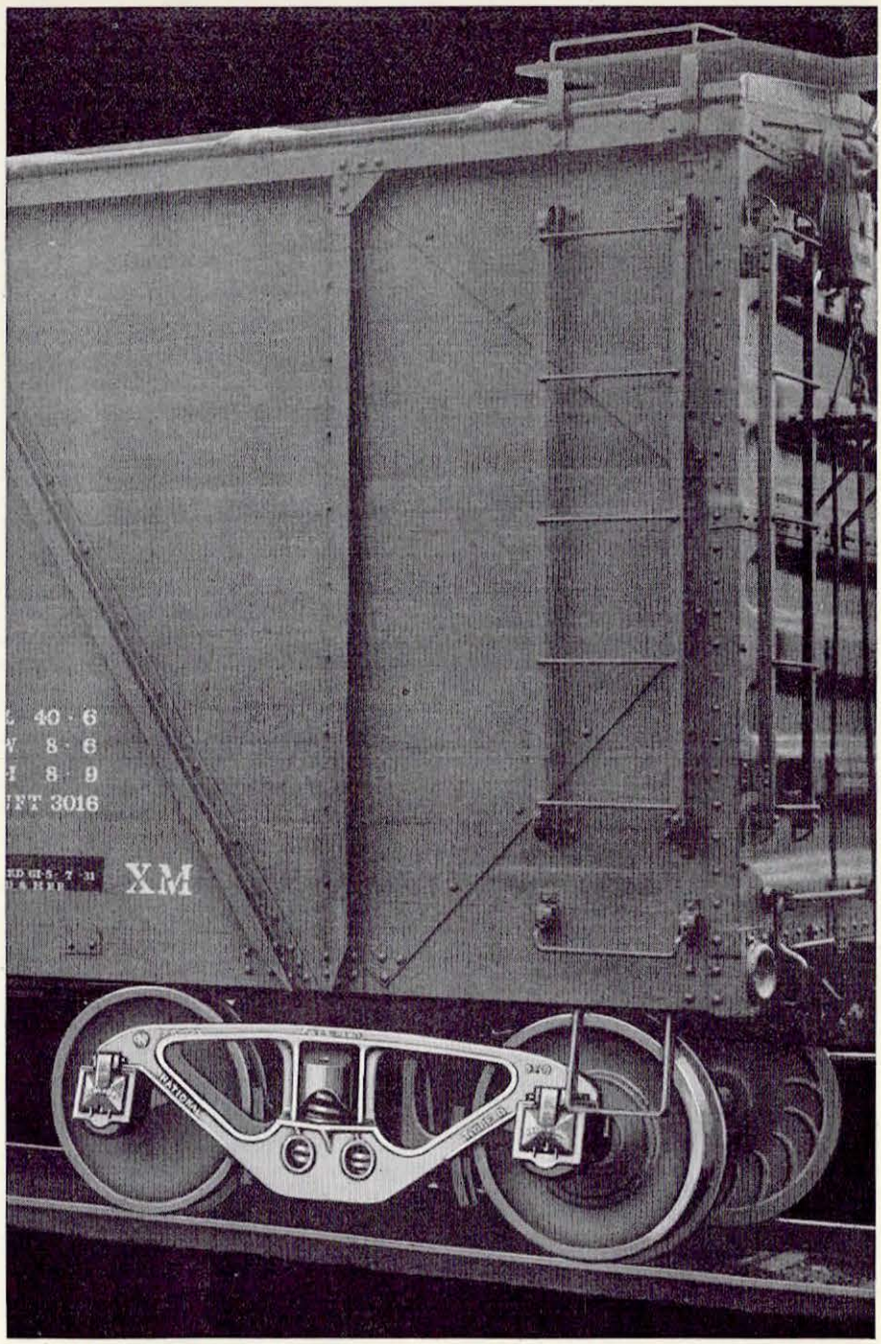

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until December, 1922, when he was made general manager of the Lines West, with headquarters at Omaha, which position he held until his recent appointment, effective September 24.

FINANCIAL, LEGAL AND ACCOUNTING

J. J. Danhof, general attorney for the Michigan Central, has been appointed general counsel, with headquarters as before at Detroit, Mich.

H. V. Cooper, freight claim agent of the Gulf Coast Lines and superintendent of freight loss and damage of the International-Great Northern (units of the Missouri Pacific), with headquarters at Houston, Tex., has had his title changed to general freight claim agent.

R. R. Richards, assistant general auditor of the Michigan Central at Detroit, Mich., has been appointed assistant general auditor, disbursements, of the New York Central, with headquarters at New York. **R. D. Murray** has been appointed local auditor of disbursements, Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Cincinnati, Ohio. **T. J. Pausch** has been appointed local auditor of disbursements, Michigan Central, with headquarters at Detroit. The jurisdiction of **M. R. Connell,** auditor of disbursements, with headquarters at New York City, has been extended to include the Michigan Central and the Cleveland, Cincinanti, Chicago & St. Louis. **R. H. Sage** has been appointed assistant general auditor, revenues, with headquarters at New York. The foregoing accounting department changes, like others previously reported in *Railway Age*, came as a result of the New York Central's taking over by lease early in 1930 its allied lines, the Michigan Central, the Big Four and other smaller roads.

OPERATING

W. D. Hall has been appointed superintendent of terminals of the Grand Trunk, with headquarters at Port Huron, Mich., succeeding **H. C. White,** transferred. Mr. Hall will continue as heretofore in charge of power plant and electrical equipment, St. Clair tunnel.

C. K. Brodhead has been appointed assistant superintendent of the Mohawk, Adirondack and Ottawa divisions of the New York Central and the Ottawa & New York Railway, with headquarters at Utica, N. Y. The jurisdiction of **H. Scott,** superintendent of the Mohawk division, has been extended to include the Adirondack and Ottawa divisions.

R. K. McClain, superintendent of transportation on the Southern, Lines East, with headquarters at Knoxville, Tenn., has been appointed general superintendent of transportation, Lines West, with headquarters at Cincinnati, Ohio, succeeding **C. M. Mitchell,** who has been appointed assistant general superintendent of transportation at Cincinnati, a newly-created position. Following the abolition of the positions of superintendents of transportation, Lines West, **C. Chandler,** superintendent of transportation, at Chattanooga, Tenn., has been appointed superintendent of the Atlanta division, with headquarters at Atlanta, Ga., and **D. B. Nolan,** superintendent of transportation, at Macon, Ga., has left the service. **Mr. Chandler** succeeds **G. W. Adams,** who has been appointed assistant superintendent, with headquarters as before at Atlanta. **J. C. Clements,** superintendent of the Alabama Great Southern (a unit of the Southern), has had his jurisdiction extended to include the New Orleans & Northeastern (also a unit of the Southern), with headquarters as before at Birmingham, Ala. **B. F. Langford,** superintendent of the New Orleans & Northeastern, has been appointed assistant superintendent of the Alabama Great Southern, with headquarters as before at Hattiesburg, Miss.

Harvey Moseley Smith, who was recently appointed general manager of the Gulf department of the Railway Express Agency, Inc., was born on March 1, 1866, at Chambers County, Ala., and received his education in the Alabama public schools and at Bingham School, Mebans, N. C. Mr. Smith began his career with the Southern Express Company in 1884. Two years later he was appointed clerk and agent at Selma, Ala., and in 1887, cashier at Atlanta, Ga. In 1891, he became chief clerk at Knoxville, Tenn., and in 1893, solicitor. In 1894, he was appointed chief clerk to superintendent at Roanoke, Va., and in 1896, he entered the service of the Norfolk & Western as route agent of the Shenandoah Valley

Harvey M. Smith

division, with headquarters at Roanoke. In 1901, he was appointed route agent of the West Virginia and Ohio division at Bluefield, W. Va., and in 1903 he returned to the Southern Express Company as agent at Atlanta, Ga. In 1908, he was advanced to superintendent, Georgia division, with headquarters at Atlanta, Ga., and when the Southern Express Company consolidated with other express companies, on July 1, 1918, Mr. Smith continued with the newly formed American Railway Express Company as superintendent. On March 1, 1929, when the American Railway Express Company was taken over by the Railway Express Agency, Inc., unifying the service on a national basis, Mr. Smith was appointed superintendent of the Georgia division, which position he held until September 1, when he was appointed general manager of the Gulf department.

A number of changes in the personnel of the Great Northern have occurred following the consolidation of a number of divisions. The St. Cloud division has been absorbed by the Mesabi, Dakota and Willmar divisions. The main line between St. Paul and St. Cloud, Minn., goes to the Willmar division, the main line between St. Cloud and Moorhead, Minn., goes to the Dakota division and the lines between Sauk Centre, Minn., and Cass Lake and between St. Cloud and the Twin Cities on the east side of the Mississippi river go to the Mesabi division. The Montana division has been absorbed by the Butte and Kalispell divisions, that part of the Montana division between Havre, Mont., and Williston, N. D., going to the Butte division and that part between Havre and Blackfoot, Mont., going to the Kalispell division. The territory comprising the Cascade division has been absorbed by the Spokane division. **M. J. Welch,** superintendent of the St. Cloud division and the Twin City terminals, with headquarters at Minneapolis, Minn., continues as superintendent of the terminals. **T. F. Dixon,** superintendent of the Montana division, with headquarters at Havre, Mont., has been transferred to the Klamath division, with headquarters at Klamath Falls, Ore., succeeding **C. A. Manthe,** who has been appointed assistant superintendent at the same point. As noted in the *Railway Age* for September 26, **C. McDonough,** general superintendent of the Lake and Eastern districts, with headquarters at St. Paul, Minn., has been appointed superintendent of the enlarged Spokane division, with headquarters at Spokane, Wash., succeeding **J. M. Doyle,** who has been appointed assistant superintendent at the same point. **A. E. Knights,** superintendent of the Cascade division, has been appointed assistant superintendent, with headquarters as before at Seattle, Wash.

TRAFFIC

G. E. Zipple, general baggage, express and mail traffic agent of the Delaware, Lackawanna & Western, at Hoboken, N. J., retired on October 1, after 48 years of service with that road.

C. M. Colberg, general agent of the New York, New Haven & Hartford, has been appointed fuel freight agent, with headquarters at New Haven, Conn., as before. **G. H. Slack,** commercial agent, has been appointed general agent, with headquarters at Boston, Mass.

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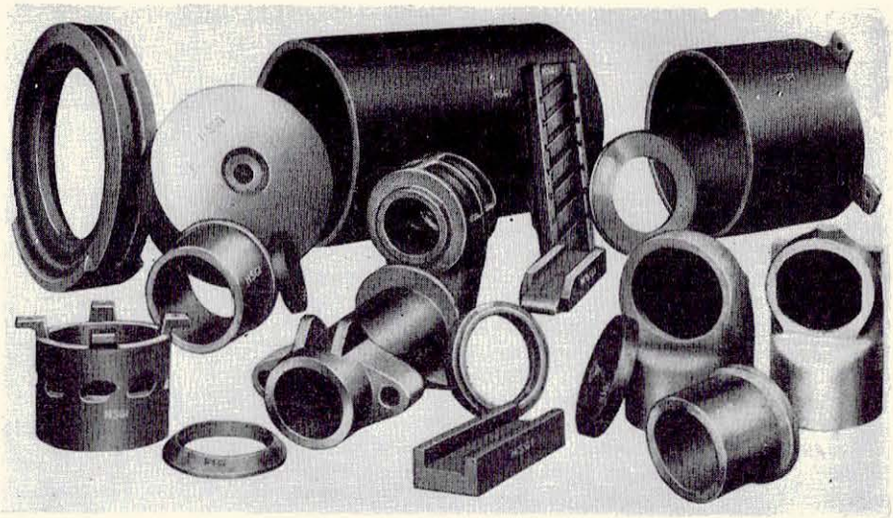
OPERATING ECONOMY



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Charles B. Sexton, assistant freight traffic manager of the Northern Pacific, with headquarters at St. Paul, Minn., retired from active service on September 30, at the age of 70 years. Mr. Sexton, who had a service record of 42 years with the Northern Pacific, was born on September 5, 1861, in Pike County, Mo., and entered the service of the Northern Pacific on September 1, 1889, as general agent at St. Louis, Mo. On August 1, 1905, he was transferred to Chicago and 13 years later he was promoted to assistant general freight agent, with headquarters at St. Paul. On March 1, 1920, he returned to Chicago as general agent and on September 15 of the same year, he was transferred to New York. Mr. Sexton was promoted to assistant freight traffic manager at St. Paul on December 1, 1926, and served continuously in that position until his retirement.

ENGINEERING AND SIGNALING

S. H. Osborne, engineer maintenance of way of the Union Pacific Railroad, with headquarters at Omaha, Neb., has been appointed division engineer of the Colorado division, with headquarters at Denver, Colo., and the position of engineer maintenance of way has been abolished. **L. W. Althof,** engineer maintenance of way of the Oregon Short Line (a unit of the Union Pacific System), with headquarters at Pocatello, Idaho, has been appointed division engineer of the Idaho division, with the same headquarters, the position of engineer maintenance of way of the Oregon Short Line having also been abolished, as noted in the *Railway Age* for August 29.

PURCHASES AND STORES

The jurisdiction of **G. D. Tombs,** division storekeeper on the Illinois Central, with headquarters at Memphis, Tenn., has been extended to include the Vicksburg Route and New Orleans divisions. The position of division storekeeper of the latter divisions which has been held by **C. S. Roberts,** with headquarters at Vicksburg, Miss., has been abolished, and Mr. Roberts has been assigned to other duties. The jurisdiction of the Burnside general store, Chicago, has been extended to include the Illinois and Springfield divisions; the position of division storekeeper of these divisions, which has been held by **R. J. Gable,** with headquarters at Clinton, Ill., has been abolished, and Mr. Gable has also been assigned to other duties.

SPECIAL

H. G. Keith has been appointed chief special agent of the Great Northern, with headquarters at St. Paul, Minn., succeeding **M. J. Lins,** who is on a leave of absence.

OBITUARY

Milton C. Figg, who for many years was auditor of the Richmond & Danville (now a part of the Southern), died at his home in Washington, D. C., on September 18.

Frank C. Batchelder, who retired on June 15, 1929, as vice-president and executive representative of the Baltimore & Ohio and president of the Baltimore & Ohio Chicago Terminal, with headquarters at Chicago, died in that city on September 27, of a heart attack. Mr. Batchelder, who was 74 years of age, served nearly 56 years with various railways. He was born at Fall River, Wis., on May 27, 1857, and after a grade school education began his railroad career on December 13, 1873, as a telegraph operator on the Chicago, Milwaukee & St. Paul. During the next 15 years, he served successively on this road as operator, agent and train dispatcher, leaving in 1888 to go with the Minneapolis, St.

Frank C. Batchelder

Paul & Sault Ste. Marie, where he served as chief train dispatcher, assistant superintendent and superintendent. Mr. Batchelder's service with the Baltimore & Ohio began on July 1, 1899, when he was appointed superintendent at Garrett, Ind. Later he was transferred to Newark, Ohio, and then was promoted to general superintendent at Baltimore, Md., again being transferred to Chicago. In 1912, he was promoted to assistant to the president, at Chicago, being elected vice-president and executive representative at that point on October 31, 1915. In addition, Mr. Batchelder was vice-president of the B. & O. C. T. from April 1, 1910, to April 11, 1912, and president of that company from the latter date until his retirement.

O. S. Jackson, general superintendent of motive power and machinery of the Union Pacific System, with headquarters at Omaha, Neb., died on September 26 at the Fontenelle Hotel in that city. Mr. Jackson was a man of broad experience in the railway mechanical field, having had about 34 years' service in the mechanical departments of various roads. He was born near Huntington, Ind., in 1875, and at the age of 14 years entered railway service as a water boy on a railroad that is now a part of the Cleveland, Cincinnati, Chicago & St. Louis. After a short term of service with the Big Four and then with the Erie, Mr. Jackson reentered the mechanical department of the former road in 1897 and served in various positions until 1905, at which time he was appointed general foreman on the Chicago, Indianapolis & Louisville. Four years later he was promoted

O. S. Jackson

to master mechanic at Lafayette, Ind., and in 1913, he was appointed superintendent of motive power of the Chicago, Terre Haute & Southeastern (now a part of the Chicago, Milwaukee, St. Paul & Pacific). A year later, Mr. Jackson was promoted to general superintendent in charge of both the mechanical and transportation departments, with headquarters as before at Terre Haute, Ind. He entered the service of the Union Pacific in September, 1921, as assistant superintendent of motive power and machinery, with headquarters at Omaha, and was promoted to superintendent of motive power and machinery in June, 1923. Mr. Jackson's further promotion to general superintendent of motive power and machinery of the Union Pacific System took place late in 1928.

* * *

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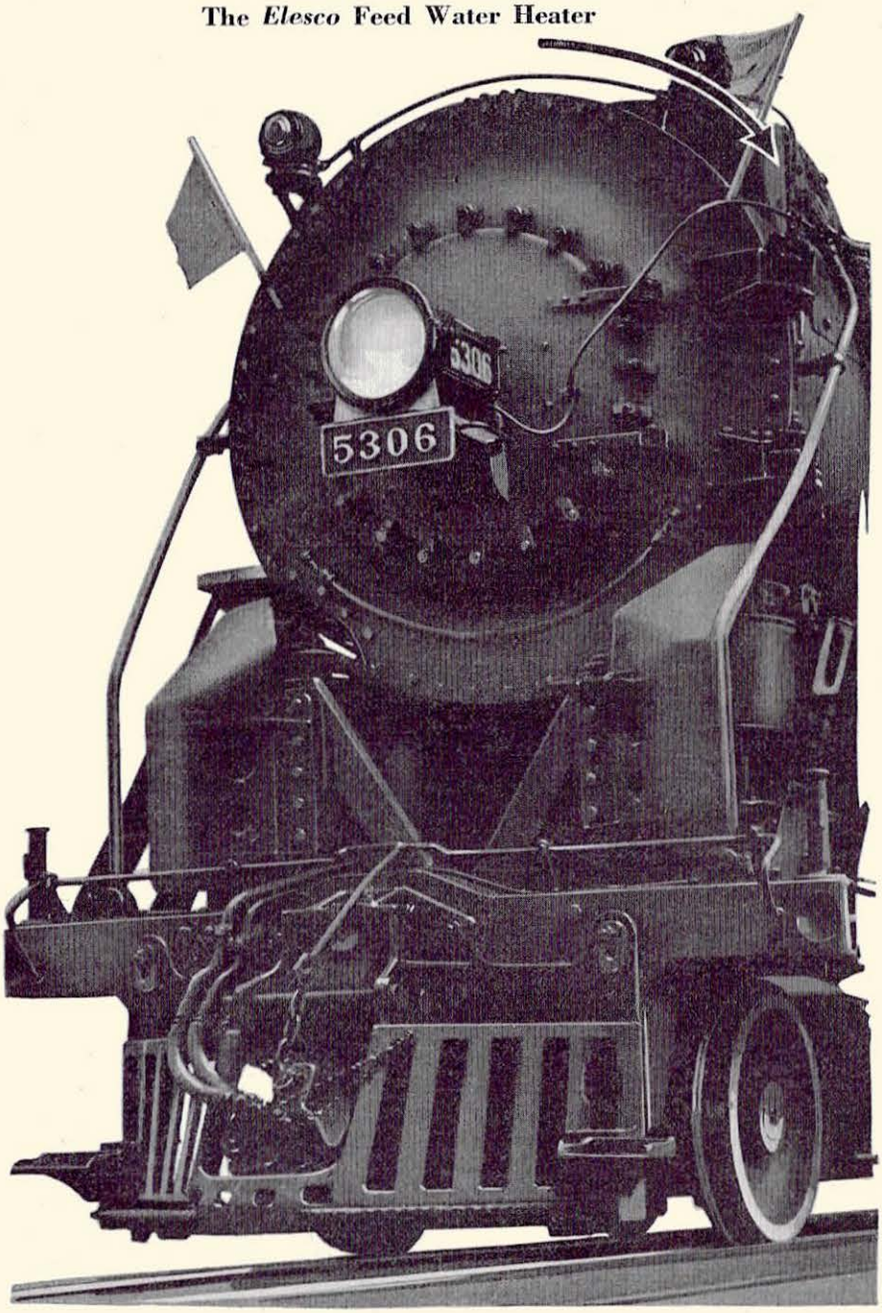

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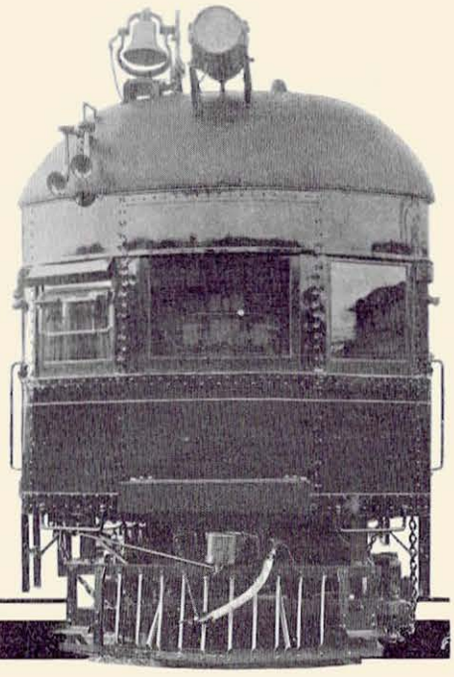

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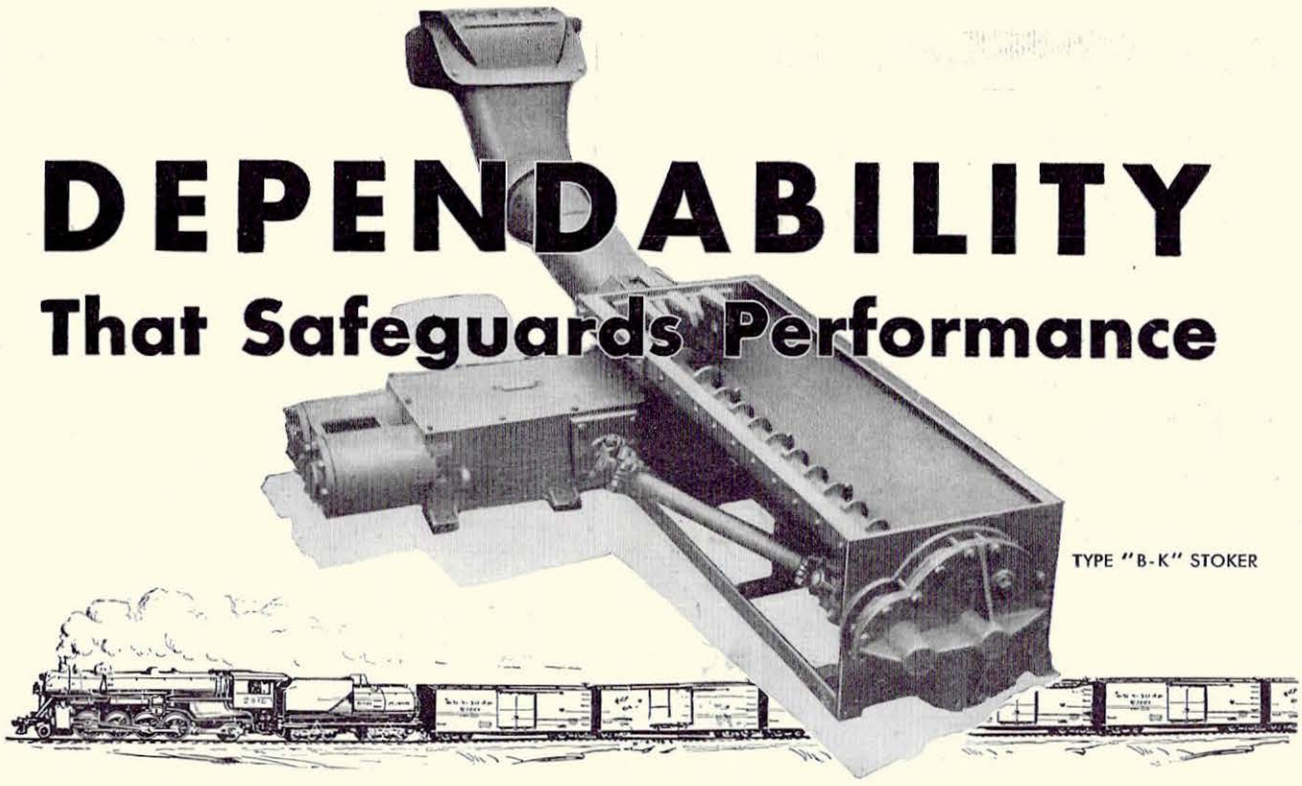

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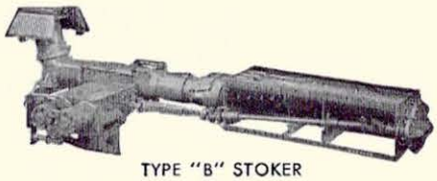

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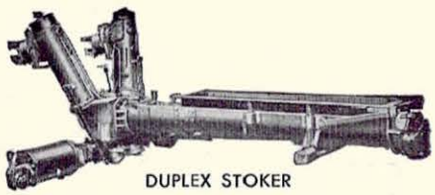

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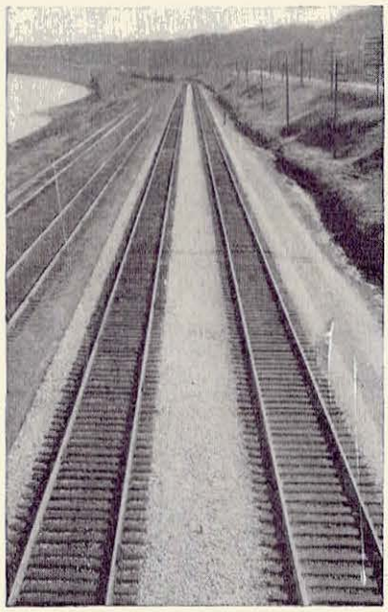

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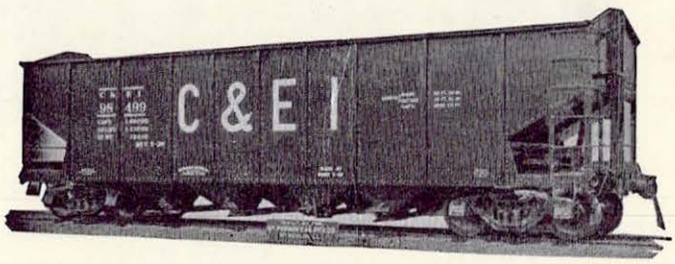

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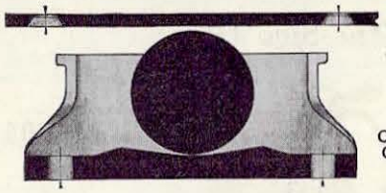

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Industrial Brownhoist Corp.

Compounds, Boiler.
Dearborn Chemical Co.
Bird-Archer Co., The.

Compounds, Cleaning.
Oakite Products, Inc.

Compounds, Cutting.
Oakite Products, Inc.

Compounds, Grinding.
Oakite Products, Inc.

Compounds, Paint Removing.
Oakite Products, Inc.

Compounds, Rust Proofing.
Oakite Products, Inc.

Compressors, Air.
Ingersoll-Rand Co.
New York Air Brake Co.
Westinghouse Air Brake Co.
Worthington Pump & Machinery Corp.

Concrete Floor Slabs.
Federal American Cement Tile Co.

Concrete Reinforcement.
American Steel & Wire Co.
Carnegie Steel Co.
Ryerson & Son, Jos. T.

Concrete Roofing, Tile.
Federal American Cement Tile Co.

Condensers.
Ingersoll-Rand Co.

Condensing Apparatus.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Conduit, Rigid.
Aluminum Co. of America.

Conduits, Metallic Flexible.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.
Graybar Electric Co.
Vapor Car Heating Co., Inc.

Conduit, Underground.
Graybar Electric Co.
Johns-Manville Corp.

Connections, Lever.
National Malleable & Steel Castings Co.

Connections, Truck.
National Malleable & Steel Castings Co.

Connections, Truck Lever.
Schaefer Equipment Co.

Contraction Joint.
General Railway Signal Co.

Control Devices, Train Speed.
Union Switch & Signal Co.

Control, Locomotive.
Valve Pilot Co.

Controllers, Electric.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Conveying Machinery.
American Bridge Co.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Orton Crane & Shovel Co.

Corrugated Sheet.
Aluminum Co. of America.

Conveyor, Ash—(See Coal, Ore and Ash Handling Mach.).

Coupler Pockets—(See Draft Yokes).

Coupler Yokes.
Bettendorf Co., The.
Gould Coupler Co.
Symington Co., The.

Couplers.
American Steel Foundries.
Buckeye Steel Castings Co.
Franklin Railway Supply Co., Inc.
Gould Coupler Co., The.
McConway & Torley Co.
National Malleable & Steel Castings Co.
Standard Coupler Co.
Westinghouse Air Brake Co.

Couplings, Hose.
Fort Pitt Malleable Iron Co.
Gold Car Heating & Lighting Co.
Ingersoll-Rand Co.
Vapor Car Heating Co., Inc.
Westinghouse Air Brake Co.

Cranes, Ballast Cleaning.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Barge.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Bracket.
Shephard-Niles Crane & Hoist Corp.

Cranes, Crawler.
American Hoist & Derrick Co.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Cranes, Crawling Shovels and Draglines.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Cranes, Diesel.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Electric Traveling.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.

Cranes, Gantry.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Ohio Locomotive Crane Co.
Orton Crane & Shovel Co.
Shephard-Niles Crane & Hoist Corp.

Cranes, Gasoline.
Industrial Brownhoist Corp
Ohio Locomotive Crane Co.

Cranes, Grab Bucket.
Milwaukee Electric Crane & Hoist Corp.

Cranes, Handpower.
Industrial Brownhoist Corp
Shephard-Niles Crane & Hoist Corp.

Cranes, Jib.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Worthington Pump & Machinery Corp.

Cranes, Locomotive.
Industrial Brownhoist Corp
Ohio Locomotive Crane Co
Orton Crane & Shovel Co

Cranes, Overhead.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Shephard-Niles Crane & Hoist Corp.

Cranes, Pillar.
Industrial Brownhoist Corp
Milwaukee Electric Crane & Hoist Corp.

Cranes, Portable.
Orton Crane & Shovel Co

Cranes, Transfer.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.

Cranes, Traveling.
Milwaukee Electric Crane & Hoist Corp.
Shephard-Niles Crane & Hoist Corp.

Cranes, Wharf.
Industrial Brownhoist Corp.
Ohio Locomotive Crane Co.

Cranes, Wrecking.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Crank Pins — (See Pins, Crank).

Creosote.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
International Creosoting & Constr. Co.
National Lumber & Creosoting Co.

Creosote, Wood Preservative Treatment.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.

Cribbing Units.
Federal American Cement Tile Co.

Cross Arms, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
Graybar Electric Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Cross Ties, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Cross Ties, Steel.
Bethlehem Steel Co.

Crossheads & Shoes.
Baldwin Locomotive Wks.
Barco Mfg. Co.
International Creosoting & Construction Co.

Crossing Signals & Signs.
Railroad Supply Co.

Crossings—(See Frogs and Crossings).

Crossings, Pavement.
Carey Co., The Philip.

Crushers, Coal.
American Sheet & Tin Plate Co.
Orton Crane & Shovel Co.

Culverts.
Armco Culvert Mfrs. Assoc.
Republic Steel Corp.
Toncan Culvert Manufacturers' Association.

Culverts, Corrugated Iron
Armco Culvert Manufacturers' Association.
Republic Steel Corp.

Culverts, Part Circle
Armco Culvert Manufacturers Association

Culverts, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Cups, Oil.
Hammett, H. S.
New York Air Brake Co.
Prime Manufacturing Co., The.
Westinghouse Air Brake Co.

Curtain Material, Car.
Ryerson & Son, Jos. T.

Curtains, Cab.
Lehon Co., The.

Cutting and Welding Apparatus.
Electric Railweld Service Corp.
Oxweld Railroad Service Co.
Westinghouse Electric & Mfg. Co.

Cut-Off Indicators and Recorders.

Cylinder Parts, Finished and Rough.
Locomotive Finished Material Co.
National Tube Co.
Valve Pilot Co.

Cylinders, Air Brake.
Westinghouse Air Brake Co.

Cylinders, Cast Steel Locomotive.
General Steel Castings Corp.

Cylinders, Locomotive
Locomotive Finished Material Co.
Union Steel Casting Co.

Deoxidizers.
Q & C Co., The.
Vanadium Corp. of America.

Derricks.
Industrial Brownhoist Corp.

Diesel Electric Power Plants.
Fairbanks-Morse & Co.
Westinghouse Elec. & Mfg. Co.

Dirt Collectors.
New York Air Brake Co.
Westinghouse Air Brake Co.

Disinfectants.
West Disinfecting Co.

Dispatching Systems.
General Railway Signal Co.
Union Switch & Signal Co.

Ditching Machinery.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Door Fixtures — (See Fixtures, Car Door).

Doors, Car.
Camel Sales Co.
Chicago Railway Equipment Co.
Miner, W. H.
Wine Railway Appliance Co.

Doors, Locomotive Firebox.
Franklin Railway Supply Co., Inc.

Doors, Rolling, Steel.
Kinnear Mfg. Co.

Draft Arms.
American Steel Foundries.
Birdsboro Steel Foundry & Machine Co.
Bradford Corporation.
Symington Co., The.
Universal Draft Gear Attachment Co.

Draft Gear Attachments.
Symington Co., The

Draft Gears.
American Steel Foundries.
Bradford Corporation.
Cardwell-Westinghouse Co.
Edgewater Steel Co.
Fort Pitt Malleable Iron Co.
Miner, W. H.
National Malleable & Steel Castings Co.
Standard Coupler Co.
Union Draft Gear Co.
Universal Draft Gear Attachment Co.

Draft Yokes.
American Steel Foundries.
Bettendorf Co., The.
Buckeye Steel Castings Co.
Gould Coupler Co., The.
McConway & Torley Co.
Miner, W. H.
Mt. Vernon Car Mfg. Co.
National Malleable & Steel Castings Co.
Pressed Steel Car Co.
Steel Car Forge Co.
Symington Co. The.
Universal Draft Gear Attachment Co.

Drainage Gates, Automatic
Armco Culvert Mfrs. Assoc.
Republic Steel Corp.

Drains, Perforated Iron.
Republic Steel Corp.

Drawbar Centering Device.
Gould Coupler Co., The.
Miner, W. H.

Drawbars, Unit Safety.
Franklin Railway Supply Co., Inc.
Industrial Brownhoist Corp.

Dredging Machinery.
Industrial Brownhoist Corp.

Drilling Machines.
Sellers & Co., Inc., Wm.

Drilling Machines, Bonding.
Railroad Supply Co.

Drilling Machines, Pneumatic
Ingersoll-Rand Co.

Drilling Machines, Rock.
General Electric Co.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Drilling Machines, Upright and Radial.
Ryerson & Son, Joseph T.
Sellers & Co., Inc., Wm.

Drills.
Ingersoll-Rand Co.

Drills, Close Corner.
Ingersoll-Rand Co.

Drills, Concrete.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Drills, Steel Rock and Steel Sharpened.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Drills, Track & Bending.
Bird-Archer Co., The.
Ingersoll-Rand Co.

Drive Gas Electric Coaches.
General Electric Co.

Drive Gas Electric Locomotives
Westinghouse Electric & Mfg. Co.

Driving Boxes (Extended Main).
Franklin Railway Supply Co., Inc.

Drop Door Mechanism.
Wine Railway Appliance Co.

Dynamos—(See Generators, Electric).

Electrical Cable Accessories.
General Electric Supply Corp.

Electric Cables.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
General Electric Supply Corp.

Electrical Instruments.
Electric Service Supplies Co.
Railroad Supply Co.
Westinghouse Elec. & Mfg. Co.

Electrical Supplies.
General Electric Co.
General Electric Supply Corp.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Electrification, Railroad.
Battey & Kipp.
General Electric Co.
United Engineers & Constructors, Inc.
Westinghouse Elec. & Mfg. Co.

Electric Heaters.
General Electric Supply Corp.

Electrical Insulation.
General Cable Corp.
General Electric Supply Corp.

Electrical Porcelain Insulators.
General Electric Supply Corp.

Electric Motors.
General Electric Supply Corp.

Electric Rivet Heaters.
General Electric Supply Corp.

Electric Switches.
General Electric Supply Corp.

Enamels.
Lowe Bros. Co., The.
Sherwin-Williams Co.

End Frames, Cast Steel, Passenger Car.
General Steel Castings Corp.

Ends, Steel.
Hutchins Car Rfg. Co.
Union Metal Products Co.

Engineers, Consulting, Civil, Elec., Hydraulic. Mechanical.
Battey & Kipp.
Hunt Co., Robt. W.
Muhlfeld, John E.
United Engineers & Constructors, Inc.

Engineers, Contracting.
Battey & Kipp.
United Engineers & Constructors, Inc.

Engineers and Contractors.
Battey & Kipp.
Hunt Co., Robert W.
Muhlfeld, John E.
United Engineers & Constructors, Inc.

Engineers, Construction.
Battey & Kipp.
Roberts & Schaefer Co.
United Engineers & Constructors, Inc.

Engineers and Contractors, Elec., Hydraulic, Mech.
Battey & Kipp.
Hunt Co., Robert W.
Muhlfeld, John E.
Roberts & Schaefer Co.

Engineers, Inspecting.
Gulick-Henderson Co.
Hunt Co., Robert W.
Muhlfeld, John E.
Pittsburgh Testing Laboratory.
United Engineers & Constructors, Inc.

Engineers, Valuation.
Hunt Co., Robert W.
United Engineers & Constructors, Inc.

Engines, Crude & Fuel Oil.
Fairbanks-Morse & Co.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Engines, Diesel.
Worthington Pump & Machinery Corp.

Engines, Gas.
Brill Co., The J. G.
Worthington Pump & Machinery Corp.

Engines, Gas & Gasoline.
American Car & Foundry Motors Co.
Fairbanks-Morse & Co.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.

Engines, Hoisting.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.

Excavators.
Industrial Brownhoist Corp.

Exhaust & Heater Pipe.
Union Asbestos & Rubber Co.

Exhaust & Ventilating Fans.
General Electric Supply Corp.

Expanders, Tube.
Ryerson & Son, Joseph T.

Fans, Exhaust & Ventilating.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Fasteners, Car Door.
Camel Sales Co.
Fort Pitt Malleable Iron Co.
Miner, W. H.
National Malleable & Steel Castings Co.

Feed Water Heater Systems.
Bird-Archer Co., The.
Worthington Pump & Machinery Corp.

Fencing Wire—(See Wire, Fence).

Fence Posts, Treated.
American Steel & Wire Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.

Ferro Alloys.
Vanadium Corp. of America.

Ferro, Chromium.
Vanadium Corp. of America.

Ferro, Molybdenum.
Vanadium Corp. of America.

Ferro, Silicon.
Vanadium Corp. of America.

Ferro, Tungsten.
Vanadium Corp. of America.

Ferro, Vanadium.
Vanadium Corp. of America.

Filters, Air.
New York Air Brake Co.
Westinghouse Air Brake Co.

Filters, Water & Industrial.
Graver Tank & Mfg. Corp

Filtration Plants (Water).
Graver Tank & Mfg. Corp.

Fireboxes.
American Locomotive Co.
Baldwin Locomotive Works.

Fire Fighting & Protection Equipment.
Johns-Manville Corp.

Fittings, Air Brakes.
Westinghouse Air Brake Co.

Fittings, Steam.
Vapor Car Heating Co., Inc.

Fixtures, Car Door.
Camel Sales Co.
Chicago Railway Equipment Co.
Miner, W. H.
National Malleable & Steel Castings Co.

Flangers, Snow.
Q & C Co., The.

Floodlights.
General Electric Supply Corp.
Graybar Electric Co.
Oxweld Railroad Service Co.
Pyle-National Co.
Symington Co., The.
Westinghouse Elec. & Mfg Co.

Floodlights, Acetylene.
Oxweld Railroad Service Co., The.

Flooring.
Carey & Co., Philip, The.
Johns-Manville Corp.

Flooring, Car.
Tuco Products Corp.

Flooring, Coach.
Tuco Products Corp.

Flooring, Composition.
Johns-Manville Corp.
Tuco Products Corp.

Flooring, Treated.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
National Lumber & Creosoting Co.

Floor Plates, Steel.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Company

Floor Slabs, Concrete.
American Cement Tile Mfg. Co.

Flue Cleaners—(See Cleaners, Flue).

Flue Cutters—(See Cutters, Flue).

Flues, Boiler—(See Tubes, Boiler).

Flue Shop Equipment.
Ryerson & Son, Joseph T.

Forges, Rivet Heating.
Ryerson & Son, Joseph T.

Forging Hammers.
Industrial Brownhoist Corp.

Forgings.
American Bridge Co.
American Steel Foundries
Baldwin Locomotive Works, The.
Bethlehem Steel Co.

Brill Co., The J. G.
Carnegie Steel Co.
Edgewater Steel Co.
General Railway Signal Co.
Gould Coupler Co., The.
Illinois Steel Co.
Midvale Co., The.
Mt. Vernon Car Mfg. Co.
Neely Nut & Bolt Co.
Pressed Steel Car Co.
Standard Steel Works Co.
Steel Car Forge Co.
Universal Draft Gear Attachment Co.

Forgings, Drop.
Baldwin Locomotive Works, The.
Brill Co., The J. G.
General Railway Signal Co.
Steel Car Forge Co.
Union Switch & Signal Co.

Forgings, Monel Metal.
International Nickel Co., The.

Foundry Supplies.
Bird-Archer Co., The.

Frames, Cast Steel Locomotive
General Steel Castings Corp.

Frames, Locomotive.
American Steel Foundries
American Locomotive Co.
Baldwin Locomotive Works
Birdsboro Steel Foundry & Machine Co.
Ohio Steel Foundry Co., The.
Union Steel Casting Co.

Frames, Truck.
American Locomotive Co.
American Steel Foundries.
Baldwin Locomotive Works
Bettendorf Co., The.
Birdsboro Steel Foundry & Machine Co.
Buckeye Steel Castings Co.
Brill Co., The J. G.
Franklin Railway Supply Co., Inc.
Gould Coupler Co., The.
Ohio Steel Foundry Co., The.
Pressed Steel Car Co.
Pyle-National Co.
Symington Co., The.

Frames, Vanadium.
American Locomotive Co.
Baldwin Locomotive Works
Birdsboro Steel Foundry & Machine Co.
Union Steel Casting Co.

Frogs and Crossings.
Bethlehem Steel Co.
Ramapo Ajax Corp.

Fulcrums, Brake Beam.
American Steel Foundries.
Brill Co., The J. G.
Buffalo Brake Beam Co.
Chicago Railway Equipment Co.
National Malleable & Steel Castings Co.

Furnaces, Electric.
General Electric Co.
Westinghouse Elec. & Mfg Co.

Furnaces, Gasoline.
Railroad Supply Co.

Furnaces, Rivet Heating—(See Forges, Rivet Heating).

Furniture.
Aluminum Co. of America

Gage Testers—(See Testers, Gage).

Gages, Air.
Westinghouse Air Brake Co.

Gages, Oxy-Acetylene.
Oxweld Railroad Service Co., The.

Gages, Steam.
Ashton Valve Co.

Gages, Tire.
Schrader's Son, Inc., A.

Gages, Wheel Press Recording.
Ashton Valve Co.

Gaskets.
Westinghouse Air Brake Co.

Gasoline.
Ethyl Gasoline Corp.

Gear Blanks, Rolled Steel.
Edgewater Steel Co.
Standard Steel Works Co.

Gears and Pinions.
American Steel Foundries.
Westinghouse Elec. & Mfg. Co.

Gears, Silent.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Gears, Valve — (See Valve Gears).

Generators, Acetylene.
Oxweld Railroad Service Co.

Generators, Electric.
Fairbanks-Morse & Co.
General Electric Co.
Graybar Electric Co.
Sunbeam Electric Mfg. Co
Westinghouse Elec. & Mfg Co.

Goggles, Welding.
Oxweld Railroad Service Co., The.
Sunbeam Electric Mfg. Co

Graders, Elevating.
Western Wheeled Scraper Co.

Grapples, Wood.
Industrial Brownhoist Corp

Grate Bars.
Q & C Co., The.

Grate Shakers, Automatic.
Franklin Railway Supply Co., Inc.

Grates.
Firebar Corp.

Grease Forming Machines.
Franklin Railway Supply Co., Inc.

Grey Iron.
American Brake Shoe & Foundry Co.

Grinders, Internal.
Micro Machine Co.

Grinders, Portable Crank Pin
Micro Machine Co.

Grinding Machines.
Sellers & Co., Inc., Wm.

Grinding Machines, Portable
Ingersoll-Rand Co.
Ryerson & Son, Inc., Joseph T.

Guard Rails, Treated.
Curtin-Howe Corp.
International Creosoting & Construction Co.

Guard Rails, Foot Guard.
Q & C Co., The.

Guard Rails (One Piece).
Bethlehem Steel Co.
Ramapo Ajax Corp.

Guard Switch Point.
Q & C Co., The.

Guards, Cattle.
American Bridge Co.

Guards, Dust.
Gould Coupler Co., The.
Symington Co., The.

Hair Felt.
Johns-Manville Corp.

Hammers, Pneumatic.
Ingersoll-Rand Co.

Hammers, Riveting.
Ingersoll-Rand Co.

Hammers, Steam.
Industrial Brownhoist Corp
Sellers & Co., Inc., Wm

Hand Brakes—(See Brakes Hand).

Hangers, Ball Bearing.
S. K. F. Industries, Inc.

Hand Rails & Fittings.
Aluminum Co. of America

Hangers, Bottom Rod Safety
Chicago Railway Equipment Co.

Hangers, Car Door—(See Fixtures, Car Door).

Headgates, Sliding
Armco Culvert Manufacturers Association

Headlight Repair Parts.
Electric.
Electric Service Supplies Co.
Pyle-National Co.
Sunbeam Electric Mfg. Co

Headlights, Electric.
General Electric Co.
Pyle-National Co., The.
Sunbeam Electric Mfg. Co
Westinghouse Electric & Mfg. Co.

Headlights, Reflectors & Cases.
Pyle-National Co.
Sunbeam Electric Mfg. Co.

Heaters, Electric.
Gold Car Heating & Lighting Co.
Westinghouse Electric & Mfg. Co.

Heaters, Feedwater.
Graver Tank & Mfg. Corp.

Heaters, Feedwater Locomotive.
Coffin Co., Jr., The J. S.
Superheater Company, The.
Worthington Pump & Machinery Corp.

Heaters, Feed Water, Stationary.
Brill Co., The J. G.
Worthington Pump & Machinery Corp.

Heating & Ventilating Apparatus.
Gold Car Heating & Lighting Co.
Vapor Car Heating Co., Inc.
Westinghouse Electric & Mfg. Co.

Heating Equipment, Car.
Gold Car Heating & Lighting Co.
Vapor Car Heating Co., Inc.
Wine Railway Appliance Co.

Heating Systems, Car (Electric and Steam).
Gold Car Heating & Lighting Co.
Vapor Car Heating Co., Inc.
Wine Railway Appliance Co.

High Temperature Cements.
Carey & Co., Philip, The

Highway Crossing Protection Devices.
American Bridge Co.
Franklin Railway Supply Co., Inc.
Griswold Signal Co.
Railroad Supply Co.

Hoists, Chain.
Milwaukee Electric Crane & Hoist Corp.
Ryerson & Son, Jos. T.

Hoists, Electric.
Milwaukee Electric Crane & Hoist Corp.

Hoists, Pneumatic.
Ingersoll-Rand Co.

Hoisting Machinery.
Industrial Brownhoist Corp.
Milwaukee Electric Crane & Hoist Corp.
Orton Crane & Shovel Co.

Hooks, Wrecking.
National Malleable & Steel Castings Co.

Horns, Pneuphonic.
Westinghouse Air Brake Co.

Hose, Air, Steam, Etc.
Ingersoll-Rand Co.
Westinghouse Air Brake Co.
Worthington Pump & Machinery Corp.

Hose, Oxy-Acetylene.
Oxweld Railroad Service Co., The.

Hose, Tender.
Westinghouse Air Brake Co.

Incandescent Lamps.
General Electric Supply Corp.

Indicators, Speed & Cut-off Valve Pilot Co.

Ingots.
Birdsboro Steel Foundry & Machine Co.
Carnegie Steel Co.
Edgewater Steel Co.
Illinois Steel Co.
McConway & Torley Co.
Standard Steel Works Co.

Injectors, Exhaust Steam.
Sellers & Co., Inc., Wm.
Superheater Co., The.

Inspection of Material and Equipment—(See Engineers, Inspection).

Insulated Wire.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
General Electric Supply Corp.

Insulation, Car.
Carey Co., Philip, The.
Wood Conversion Co.

Insulation, Car, Bldg.
Carey Co., Philip, The.
Johns-Manville Corp.
Lehon Co., The.
Tuco Products Corp.
Union Asbestos & Rubber Co.
Wood Conversion Co.

Insulation, Electrical.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Insulation, Exhaust & Heater Pipe.
Carey Co., Philip, The.
Johns-Manville Corp.
Tuco Products Corp.
Union Asbestos & Rubber Co.

Insulation, Heat.
Carey Co., Philip, The.
Miner, W. H.

Insulation Tape.
General Electric Supply Corp.

Insulators, Electrical, Porcelain.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Interlocking Plant Equipment.
General Railway Signal Co.
Union Switch & Signal Co.

Iron Chain.
Falls Hollow Staybolt Co.
Lockhart Iron & Steel Co.
Ryerson & Son, Joseph T.

Iron, Charcoal.
Bethlehem Steel Co.
Ewald Iron Co.
Falls Hollow Staybolt Co.
Lockhart Iron & Steel Co.
Ryerson & Son, Joseph T.

Iron, Engine Bolt.
Lockhart Iron & Steel Co.
Ryerson & Son, Joseph T.

Iron, Forging Billets.
Lockhart Iron & Steel Co.

Iron, Hollow Staybolt.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.

Iron, Hollow Staybolt Bars.
Bethlehem Steel Co.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.

Iron, Pig.
Bethlehem Steel Co.

Iron, Refined.
Ewald Iron Co.
Falls Hollow Staybolt Co.
Lockhart Iron & Steel Co.
Reading Iron Co.
Ryerson & Son, Joseph T.

Iron, Staybolt — (See also Staybolts).
Ewald Iron Co.
Falls Hollow Staybolt Co.
Lockhart Iron & Steel Co.
Reading Iron Co.
Ryerson & Son, Joseph T.

Jacking, Locomotive.
Carey Co., Philip, The.

Jacking Method of Installing Pipe
Armco Culvert Manufacturers Association

Jacks, Smoke.
Carey Co., Philip, The.
Johns-Manville Corp.

Joints, Air Reservoir.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Joints, Blow Off Line (Roundhouse).
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Joints, Coach and Coach Yard.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Joints, Flexible.
Franklin Railway Supply Co., Inc.
Vapor Car Heating Co. Inc.

Joints, Flexible Ball.
Barco Mfg. Co.

Joints, Rail.
American Steel Foundries
Carnegie Steel Co.
Illinois Steel Co.
Q & C Co., The.
Rail Joint Co.
Union Switch & Signal Co

Joints, Steam, Air & Liquid
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.
Vapor Car Heating Co. Inc.

Joints, Swing.
Barco Mfg. Co.
Vapor Car Heating Co. Inc.

Journal Boxes and Lids.
Allegheny Steel Co.
American Steel Foundries.
Brill Co., The J. G.
Gould Coupler Co., The.
Hunt-Spiller Mfg. Corp.
National Malleable & Steel Castings Co.
Pullman Car & Mfg. Corp.
Railway Steel Spring Co.
Symington Co., The.
Union Spring & Mfg. Co.

Journal Oilers, Car & Locomotive.
Ardco Mfg. Co.

Keys, Brake Shoe.
Bradford Corporation.
Buffalo Brake Beam Co.
Mt. Vernon Car Mfg. Co.
Steel Car Forge Co.
Union Spring & Mfg. Co.

Knuckles, Emergency.
Q & C Co., The.

Laboratories, Testing.
Hunt Co., Robert W.
Pittsburgh Testing Laboratory.

Lacquers.
General Electric Supply Corp.
Sherwin-Williams Co.

Ladders, Steel Car.
Wine Railway Appliance Co.

Lagging, Locomotive.
Carey & Co., Philip, The.
Johns-Manville Corp.

Lamps, Incandescent.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Lamps, Inspector's.
Oxweld Railroad Service Co., The.

Lath, Metal
Armco Railroad Sales Co.

Lathes, Axle.
Sellers & Co., Inc., Wm

Lathes, Engine.
Ryerson & Son, Joseph T.

Lathes, Wheel.
Sellers & Co., Inc., Wm.

Lead, White.
National Lead Co.

Lighting Equipment, Car.
Electric Storage Battery Co.

Lighting Fixtures and Systems.
General Electric Supply Corp.
Graybar Electric Co.
Pyle-National Co.

Lighting Plants, Gas, Electric
Pyle-National Co., The.
Sunbeam Electric Mfg. Co.

Lightning Arresters.
General Electric Supply Corp.

Line Material.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Lock Nuts—(See Nut Locks)

Locomotive Jacket Sheets.
Armco Railroad Sales Co.

Locomotive Water Conditioners
Bird-Archer Co., The.

Locomotives, Contractors.
American Locomotive Co.
Baldwin Locomotive Works.
Lima Locomotive Works.

Locomotives, Electric.
American Locomotive Co.
Baldwin Locomotive Works.
General Electric Co.
Lima Locomotive Works
Westinghouse Elec. & Mfg. Co.

Locomotives, Gasoline.
Baldwin Locomotive Works.
Lima Locomotive Works

Locomotives, Gas-Electric.
Brill Co., The J. G.
Electro-Motive Co.

Locomotives, Geared.
Lima Locomotive Works.

Locomotives, Industrial.
American Locomotive Co.
Baldwin Locomotive Works.
General Electric Co.
Lima Locomotive Works.
Westinghouse Elec. & Mfg. Co.

Locomotives, Mine.
American Locomotive Co.
Baldwin Locomotive Works.
General Electric Co.
Lima Locomotive Works.
Westinghouse Elec. & Mfg. Co.

Locomotives, Oil Engine, Electric Driven.
American Locomotive Co.
Baldwin Locomotive Works.
General Electric Co.
Ingersoll-Rand Co.
Westinghouse Elec. & Mfg. Co
Whitcomb Co., Geo. D. The.

Locomotives, Rebuilt.
American Locomotive Co.
Locomotives, Repair Parts.
American Locomotive Co.
Baldwin Locomotive Works.
Lima Locomotive Works.
Locomotives, Steam.
American Locomotive Co.
Baldwin Locomotive Works
Lima Locomotive Works.
Locomotive Stokers.
Standard Stoker Co.
Locomotive Valve Pilot.
Valve Pilot Co.
Lubricators, Driving Box.
Franklin Railway Supply Co., Inc.
Lubricators, Piston Rod.
Q & C Co., The.
Lumber, Asbestos.
Carey & Co., Philip, The.
Johns-Manville Corp.
Lumber, Treated.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
Industrial Lumber & Creosoting Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.
Machinery, Hydraulic.
Birdsboro Steel Foundry & Mach. Co.
Machine Screws, Monel Metal
International Nickel Co., The.
Magnets, Lifting.
Industrial Brownhoist Corp.
Electro Metallurgical Sales Corp.
Mechanical Draft Apparatus—(See Heating and Vent. App.).
Mechanical Stokers.
Standard Stoker Co.
Melters, Snow, Electric.
Q & C Co., The.
Metallic Flexible Conduit.
General Electric Supply Corp.
Meters, Water & Oil.
Worthington Pump & Machinery Corp.
Milling Machines, Planer Type.
Sellers & Co., Inc., Wm.
Milling Machines, Plain and Universal.
Ryerson & Son, Joseph T.
Milling Machines, Portable Frame Jaw.
Micro Machine Co.
Mohair Upholstery Velvets.
Chase & Co., L. C.
Massachusetts Mohair Plush Co.
Molybdenum Metal.
Vanadium Corp. of America.
Monel Metal, Rods, Sheets, Tubes, Wire, etc.
International Nickel Co., The.
Motors, Electric.
Fairbanks-Morse & Co.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.
Motors & Generators.
Fairbanks-Morse & Co.
Moulding.
Aluminum Co. of America.
Multiple V Belt Drives.
Worthington Pump & Machinery Corp.
Nails.
American Steel & Wire Co.
Reading Iron Co.
Ryerson & Son, Joseph T.
Nipples, Air Hose.
Prime Manufacturing Co.
Nozzles, Exhaust.
Franklin Railway Supply Co., Inc.
Nozzles, Oxy-Acetylene Cutting.
Oxweld Railroad Service Co., The.
Nuts—(See Bolts and Nuts).
Nut Locks.
Dardelet Threadlock Corp.
Grip Nut Co.
Nuts, Tank Hose.
Prime Manufacturing Co., The.
Office Appliances.
Remington-Rand Business Service.
Oils, Diesel Engine
Vacuum Oil Co.
Oil, Dynamo
Vacuum Oil Co.
Oil-Electric Locomotives.
American Locomotive Co.
General Electric Co.
Ingersoll-Rand Co.
Westinghouse Elec. & Mfg. Co.
Oil Filtering & Storage Systems.
Graver Tank & Mfg. Corp.
Oils & Greases, Engine
Vacuum Oil Co.
Oils & Greases, Lubricating
Vacuum Oil Co.
Oils & Greases, Motor
Vacuum Oil Co.
Oil, Linseed.
National Lead Co.
Oils, Locomotive Valve
Vacuum Oil Co.
Oil Plugs, Steam Chest.
Franklin Railway Supply Co., Inc.
Oil, Turbine
Vacuum Oil Co.
Oxy-Acetylene Apparatus.
Oxweld Railroad Service Co., The.
Oxygen.
Oxweld Railroad Service Co., The.
Packing.
Westinghouse Air Brake Co.
Packing, Air Pump.
Johns-Manville Corp.
Pilot Packing Co.
Union Asbestos & Rubber Co.
Westinghouse Air Brake Co.
Packing, Asbestos.
Packing, Cylinder and Valve Ring.
Johns-Manville Corp.
Hunt-Spiller Mfg. Corp.
Locomotive Finished Material Co.
Westinghouse Air Brake Co.
Packing, Locomotive Cab Cock.
Johns-Manville Corp.
Union Asbestos & Rubber Co.
Packing, Ring Boiler.
Union Asbestos & Rubber Co.
Packing, Semi-Metallic.
Pilot Packing Co.
Central Alloy Steel Corp.
Packing, Sheet.
Johns-Manville Corp.
Union Asbestos & Rubber Co.
Packing, Soft.
Carey & Co., Philip, The.
Johns-Manville Corp.
Pilot Packing Co.
Union Asbestos & Rubber Co.
Packing, Throttle.
Johns-Manville Corp.
Union Asbestos & Rubber Co.
Paint Burners, Acetylene.
Oxweld Railroad Service Co., The.
Paint, Metal Protective.
Lowe Bros. Co., The.
National Lead Co.
Sherwin-Williams Co.
Paint, Powder.
Aluminum Co. of America.
Paint Spraying Equipment.
De Vilbiss Mfg. Co., The.
Paints.
Lowe Bros. Co., The.
National Lead Co.
Sherwin-Williams Co.
Paper, Carbon.
Remington-Rand Business Service.
Paper, Sheathing.
Carey & Co., Philip, The.
Patterns, for Iron, Steel & Brass Castings.
Baldwin Locomotive Works, The.
Pavement Breakers.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.
Pickling Equipment, Monel Metal.
International Nickel Co., The.
Pile Drivers.
Industrial Brownhoist Corp.
Orton Crane & Shovel Co.
Piling, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Piling, Sheet Steel.
American Bridge Co.
Carnegie Steel Co.
Inland Steel Company
Piling, Wood.
National Lumber & Creosoting Co.
Pilot Beams, Cast Steel.
General Steel Castings Corp.
Gould Coupler Co., The.
Pilots, Cast Steel.
General Steel Castings Corp.
Locomotive Finished Material Co.
Pins, Air Brake & Clevis.
Champion Rivet Co.
Pins, Center.
Miner, W. H.
Pins, Coupler Knuckle.
Champion Rivet Co.
McConway & Torley Co.
National Malleable & Steel Castings Co.
Pins, Crank.
American Locomotive Co.
Baldwin Locomotive Works.
Miner, Inc., W. H.
Standard Steel Works Co.
Union Asbestos & Rubber Corp.
Pipe, Corrugated Iron
Armco Culvert Manufacturers Association
Pipe, Paved Invert
Armco Culvert Manufacturers Association
Pipe Coverings.
Carey & Co., Philip, The
Johns-Manville Corp.
Keasby & Mattison Co.
Pipe Fittings—(See Fittings, Pipe).
Pipe, Metal Culvert.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Republic Steel Corp.
Pipe, Perforated Iron
Armco Culvert Manufacturers Association
Pipe, Spiral Welded.
Armco Railroad Sales Co
Pipe, Steel Signal.
National Tube Co.
Pipe, Spiral Welded.
Armco Railroad Sales Co
Pipe, Wrought Iron.
Byers Co., A. M.
Reading Iron Co.
Planers, Plate.
Ryerson & Son, Jos. T.
Sellers & Co., Inc., Wm.
Plates.
Steel Car Forge Co.
Plates, Follower.
Steel Car Forge Co.
Plates, Boiler, Firebox—(See Steel Firebox).
Plates, Center—(See Bearings, Center).
Plates, Iron & Steel.
Armco Railroad Sales Co.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.
Plate & Sheet Metal Work.
Baldwin Locomotive Works, The.
Plates, Tie.
Illinois Steel Co.
Inland Steel Company.
Railroad Supply Co.
Tennessee Coal, Iron & Railroad Co.
Plates, Tin and Terne.
American Sheet & Tin Plate Co.
Platforms, Car.
Gould Coupler Co., The.
Standard Coupler Co.
Platforms, Cast Steel, Passenger Car.
General Steel Castings Corp.
Plows, Railroad and Grading.
Western Wheeled Scraper Co.
Plows, Snow.
American Locomotive Co.
Brill Co., The J. G.
Q & C Co., The.
Plush, Mohair.
Chase & Co., L. C.
Massachusetts Mohair Plush Co.
Pneumatic Tools.
Ingersoll-Rand Co.
Poles, Creosoted.
National Lumber & Creosoting Co.
Poles, Power Distribution.
National Lumber & Creosoting Co.
Poles, Preservatively Treated.
National Lumber & Creosoting Co.
Poles, Signal.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
General Railway Signal Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.
Union Switch & Signal Co.
Poles, Steel Tubular.
Graybar Electric Co.
National Tube Co.
Poles, Telegraph.
National Lumber & Creosoting Co.
Poles, Transmission.
National Lumber & Creosoting Co.
Poles, Treated.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
General Electric Supply Corp.
Curtin-Howe Corp.
Graybar Electric Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.
Poles, Wood
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Posts, Farm.
National Lumber & Creosoting Co.
Posts, Fence, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
Inland Steel Co.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.
Posts, Highway.
National Lumber & Creosoting Co.
Posts, Steel Fence.
American Steel & Wire Co.
Q & C Co., The.
Posts, Wood.
National Lumber & Creosoting Co.
Powder, Blasting—(See Explosives).
Powdered Coal Equipment.
Muhlfeld, John E.
Power Plants.
General Electric Co.
Muhlfeld, John E.
United Engineers & Constructors, Inc.
Westinghouse Elec. & Mfg. Co.
Power Transmission Supplies.
Sellers & Co., Inc., Wm.
Preservatives, Wood.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
National Lumber & Creosoting Co.
Presses, Flanging Hydraulic.
Birdsboro Steel Foundry & Machine Co.
Presses, Hydraulic.
Baldwin-Southwark Corp.
Birdsboro Steel Foundry & Machine Co.
Presses, Wheel.
Birdsboro Steel Foundry & Machine Co.
Sellers & Co., Inc., Wm.
Pulverizers, Coal — (See Crushers, Coal).
Pumping Stations.
Fairbanks-Morse & Co.
Pump Liners, Monel Metal.
International Nickel Co., The.
Pump Rods, Monel Metal.
International Nickel Co., The.
Pump Shafts, Monel Metal.
International Nickel Co., The.
Pumps, Hydraulic.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.
Pumps & Pumping Mchy.
Fairbanks-Morse & Co.
Ingersoll-Rand Co.
Westinghouse Air Brake Co.
Worthington Pump & Machinery Corp.
Poles, Creosoted.
National Lumber & Creosoting Co.
Pumps, Vacuum.
Ingersoll-Rand Co.
Worthington Pump & Machinery Corp.
Punching and Shearing Machines.
Ryerson & Son, Joseph T.
Pushers, Coal.
Standard Stoker Co.
Pyrometers, Superheated Steam.
Superheater Co., The.
Rail Anchors.
Bethlehem Steel Co.
P. & M. Co., The.
Rail-Bonds.
American Steel & Wire Co.
General Electric Co.
General Railway Signal Co.
Graybar Electric Co.
Railroad Supply Co.
Union Switch & Signal Co.
Westinghouse Elec. & Mfg. Co.
Rail Braces — (See Braces, Rail).
Rail Reclamation Equipment.
Ryerson & Son, Joseph T.
Railroad Shops.
United Engineers & Constructors, Inc.
Rail Splice Plates — (See Joints, Rail).
Railroad Structures — (See Engineers and Contractors; also Building).
Rails.
Bethlehem Steel Co.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Inc., Joseph T.
Tennessee Coal, Iron & Railroad Co.
Thomson Rail Corp.
Railway Signals.
General Electric Supply Corp.
Rattan.
Hale-Kilburn Co.
Heywood-Wakefield Co.
Receivers, Air.
Ingersoll-Rand Co.
Westinghouse Air Brake Co.
Recorders, Speed & Cut-off.
Valve Pilot Co.
Rectifiers for Signal Work.
General Electric Co.
Railroad Supply Co.
Union Switch & Signal Co.
Reducing Valves.
Vapor Car Heating Co., Inc.
Reflectors, Headlight.
Pyle-National Co., The.
Sunbeam Electric Mfg. Co.
Refrigerators.
Wine Railway Appliance Co.
Regulators, Oxy-Acetylene.
Oxweld Railroad Service Co., The.

Relays.
General Railway Signal Co.
Railroad Supply Co.
Union Switch & Signal Co.
Westinghouse Elec. & Mfg. Co.

Removers, Paint & Varnish.
Oakite Products, Inc.

Repair Parts, Stoker.
Standard Stoker Co.
Q & C Company, The.

Retorts, Creosoting.
Graver Tank & Mfg. Corp.

Reverse Gear, Power.
Barco Mfg. Co.
Franklin Railway Supply Co., Inc.

Ringers, Bell.
Hammett, H. S.

Rivet Cutters.
Ingersoll-Rand Co.

Riveters, Hydraulic.
Birdsboro Steel Foundry & Machine Co.

Riveting Machines.
Ingersoll-Rand Co.

Rivets.
Inland Steel Co.
Neely Nut & Bolt Co.
Ryerson & Son, Joseph T.
Pressed Steel Car Co.
Russell, Burdsall & Ward Bolt and Nut Co.

Rods.
Neely Nut & Bolt Co

Rolled Steel.
Carnegie Steel Co.

Roller Bearings—(See Bearings, Roller).

Rolls, Bending & Straightening.
Birdsboro Steel Foundry & Machine Co.

Roof Slabs, Concrete.
Federal American Cement Tile Co.

Roofing, Asbestos.
Carey & Co., Philip, The.
Johns-Manville Corp.
Lehon Co., The.

Roofing, Buildings.
Armco Railroad Sales Co.
Carey Co., Philip, The.
Lehon Co., The.
Johns-Manville Corp.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).

Roofing, Car.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Carey & Co., Philip, The.
Hutchins Car Rfg. Co.
Johns-Manville Corp.
Lehon Co., The.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).
Tuco Products Corp.
Union Metal Products Co.

Roofing, Corrugated.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Carey Co., Philip, The.
Johns-Manville Corp.

Roofing, Tile.
Federal American Cement Tile Co.

Roofing, Tile, Cement.
Federal American Cement Tile Co.

Roofing, Tin.
American Sheet & Tin Plate Co.

Rope, Wire — (See Wire Rope).

Rust Preventatives.
Dearborn Chemical Co.
Oakite Products, Inc.

Safe Ends.
National Tube Co.

Sand Drying Plants.
Roberts & Schaefer Co.

Sanitary Products.
West Disinfecting Co.

Sash Balances.
Tuco Products Co.

Saws, Circular Metal.
Ryerson & Son, Joseph T.

Saws, High Speed, Friction.
Ryerson & Son, Joseph T.

Saws, Portable Rail.
Industrial Brownhoist Corp.
Q & C Co., The.

Scales.
Fairbanks-Morse & Co.

Scrapers, Wheeled and Drag.
Western Wheeled Scraper Co.

Screens, Passenger Car.
Tuco Products Corp.

Seats, Car.
Brill Co., The J. G.
Hale-Kilburn Co.
Heywood-Wakefield Co.

Seats, Coach.
Brill Co., The J. G.

Shafting.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.
Sellers & Co., Inc., Wm.
Standard Steel Works Co.

Shapers.
Ryerson & Son, Joseph T.

Shapes, Pressed Steel.
Pressed Steel Car Co.
Sellers & Co., Inc., Wm.

Shapes, Structural.
Bethlehem Steel Co.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sheds, Train.
American Bridge Co.
Inland Steel Co.

Sheets, Black and Galvanized.
Allegheny Steel Co.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Inland Steel Co.
Republic Steel Corp.
Ryerson & Son, Joseph T.

Sheets, Blue Annealed.
Allegheny Steel Co.

Sheets, Building, Special Car, Corrugated & Plain.
Armco Railroad Sales Co.

Sheets, Corrugated.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Carey Co., Philip, The.
Carnegie Steel Co.
Johns-Manville Corp.
Ryerson & Son, Joseph T.

Sheets, Corrugated & Plain.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sheets, Electrical.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Republic Steel Corp.
Ryerson & Son, Joseph T.

Sheets, Iron & Steel.
Armco Railroad Sales Co.
Bethlehem Steel Co.
Superior Sheet Steel Co., The (Division of Continental Steel Corp.).

Sheets, Locomotive Jacket.
American Sheet & Tin Plate Co.
Armco Railroad Sales Co.
Inland Steel Co.
Ryerson & Son, Inc., Joseph T.

Sheets, Polished or Planished Iron.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.

Sheets, Steel.
Armco Railroad Sales Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Sherardising Plants.
General Electric Co.

Shop Calling Systems—(See Systems, Communication).

Shops, Railroad—(See Buildings, Iron, Steel and Steel Concrete).

Shovels & Draglines.
Industrial Brownhoist Corp.

Shovels, Steam, Gasoline & Electric.
Orton Crane & Shovel Co.

Siding, Iron & Steel.
Armco Railroad Sales Co.

Siding., Bldg., Car, Corrugated & Plain.
Kinnear Mfg. Co.
Armco Railroad Sales Co.
American Sheet & Tin Plate Co.
Inland Steel Co.
Ryerson & Son, Inc., Joseph T.

Siding, Corrugated & Plain.
Carey & Co., Philip, The.
Johns-Manville Corp.

Signal Accessories.
Electric Storage Battery Co.
General Electric Co.
General Railway Signal Co.
Graybar Electric Co.
Railroad Supply Co.
Union Switch & Signal Co.
Westinghouse Elec. & Mfg. Co.

Signals, Automatic Cab.
General Railway Signal Co.
Union Switch & Signal Co.

Signal Blades.
General Railway Signal Co.
Union Switch & Signal Co

Signals, Crossing.
Union Switch & Signal Co.

Signals, Crossing Protection.
General Railway Signal Co.
Railroad Supply Co.

Signals, Railway.
General Electric Co.
Union Switch & Signal Co.

Sign Posts, Treated.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.

Signs, Highway Crossing.
Railroad Supply Co.

Silico Manganese.
Vanadium Corp. of America.

Slabs, Concrete Floor.
Federal Cement Tile Co.

Slag, Blast Furnace.
Carnegie Steel Co.

Slotting Machines.
Sellers & Co., Inc., Wm.

Slotting Machines, Locomotive Cylinder.
American Steel & Wire Co.

Sludge Removers.
Bird-Archer Co., The.

Soap, Liquid.
West Disinfecting Co.

Solder.
National Bearing Metals Corp.
Ryerson & Son, Inc., Joseph T.
Westinghouse Elec. & Mfg. Co.

Spark Arresters.
Locomotive Firebox Co.

Speed Indicators & Recorders.
Valve Pilot Corp.

Spelter—(See Zinc).

Spikes.
American Steel & Wire Co.
Bethlehem Steel Co.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Splice Bars, Angle.
Carnegie Steel Co.
Illinois Steel Co.
Inland Steel Co.

Spring Plates or Seats.
Allegheny Steel Co.
National Malleable & Steel Castings Co.
Union Spring & Mfg. Co.

Springs.
American Steel Foundries Co.
American Steel & Wire Co
Baldwin Locomotive Works The.
Pittsburgh Spring & Steel Co.
Railway Steel Spring Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.
Union Switch & Signal Co.

Springs, Shop Equipment.
Ryerson & Son, Joseph T

Springs, Vanadium Steel.
Pittsburgh Spring & Steel Co.
Union Spring & Mfg. Co.

Stacks, Steel.
American Bridge Co.
Graver Tank & Mfg. Corp.

Stands, Switch & Target.
Q & C Co., The.

Staybolts.
American Locomotive Co.
Ewald Iron Co.
Ryerson & Son, Joseph T.

Staybolts, Hollow.
Falls Hollow Staybolt Co.
Ryerson & Son, Joseph T.

Steam Chests.
Franklin Railway Supply Co., Inc.

Steam Enclosures, Corrugated Iron.
Republic Steel Corp.

Steam Shovels.
Orton Crane & Shovel Co.

Steel Alloy.
Illinois Steel Co.
Ryerson & Son, Joseph T.
Republic Steel Corp.
Standard Steel Works Co.

Steel, Firebox.
Carnegie Steel Co.
Illinois Steel Co.

Steel & Iron, Stainless.
Allegheny Steel Co

Steel, Open Hearth.
Carnegie Steel Co.
Illinois Steel Co.

Steel Plate Construction.
Graver Tank & Mfg. Corp.

Steel, Pressed Specialties.
Hale-Kilburn Co.

Steel, Structural.
American Bridge Co.
Carnegie Steel Co.
Graver Tank & Mfg. Corp.
Illinois Steel Co.
Inland Steel Co.
Ryerson & Son, Joseph T.

Steel, Tool.
Illinois Steel Co.
Midvale Co., The.
Q & C Co., The.
Ryerson & Son, Joseph T

Step Joints.
Q & C Co., The.
Rail Joint Co.

Steps, Car—(See Car Steps, Safety)

Stokers, Locomotive.
Lower Stoker Co.
Standard Stoker Co.

Stokers, Mechanical.
Westinghouse Elec. & Mfg. Co.

Stoker Repair Parts.
Lower Stoker Co.
Standard Stoker Co.

Storm Sewers, Corrugated Iron.
Republic Steel Corp.

Strainer, Air.
Westinghouse Air Brake Co.

Strainers, Tank Hose.
Prime Mfg. Co., The.

Stringers, Bridge, Treated.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.

Structural Shapes, Rolled Shapes.
Carnegie Steel Co.

Superheaters.
Superheater Co., The.

Supports, Bottom Rod Safety.
Chicago Railway Equipment Co.

Switch Boards.
Graybar Electric Co.
Johns-Manville Corp.
Westinghouse Elec. & Mfg. Co.

Switch Machines.
General Railway Signal Co.

Switch Movements.
Union Switch & Signal Co.

Switch Ties, Treated.
American Creosoting Co.
Century Wood Preserving Co.
(Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Switches, Electric.
Electric Service Supplies Co.
General Electric Co.
Graybar Electric Co.
Westinghouse Elec. & Mfg. Co.

Switches & Switch Stands.
Ramapo Ajax Corp.

Syphons, Corrugated Iron.
Republic Steel Corp.

Syphons, Locomotive.
Locomotive Firebox Co.

Syphons, Locomotive, Boilers
Locomotive Firebox Co.

Tables, Welding.
Oxweld Railroad Service Co., The.

Tables, Welding.
Oxweld Railroad Service Co., The.

Tamping Machines, Tie.
Ingersoll-Rand Co.

Tamping Outfits, Tie.
Ingersoll-Rand Co.

Tank Cars.
General American Tank Car Corp., The.

Tanks, Acetylene, Gas.
Oxweld Railroad Service Co., The.

Tanks, Air, Gas, Oil and Water.
Baldwin Locomotive Works, The.
Graver Tank & Mfg. Corp.

Tanks, Water.
American Bridge Co.
American Locomotive Co.
National Tube Co.
Pressed Steel Car Co.
Westinghouse Air Brake Co.

Tape, Insulation.
Johns-Manville Corp.
Westinghouse Elec. & Mfg. Co.

Taps, Staybolt.
Ryerson & Son, Joseph T.

Tele. & Tele. Wire.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
General Electric Supply Corp.

Terminals, Railroad.
United Engineers & Constructors, Inc.

Testers, Boiler.
Sellers & Co., Inc., Wm.

Testers, Gage.
Ashton Valve Co.

Testers, Rail.
Sperry Products, Inc.

Testers, Staybolt.
Flannery Bolt Co.

Testing Machines.
Baldwin-Southwark Corp.

Thermostats.
Gold Car Heating & Lighting Co.
Vapor Car Heating Co. Inc.

Tie Plates.
Bethlehem Steel Co.
Illinois Steel Co.
Inland Steel Company
Railroad Supply Co.

Ties, Creosoted.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Ties, Steel.
American Bridge Co.
Bethlehem Steel Co.
Carnegie Steel Co.

Ties, Treated.
American Creosoting Co.
Century Wood Preserving Co. (Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.

Tile, Cement, Concrete.
Federal American Cement Tile Co.

Timbers, Pre-framed, Treated
National Lumber & Creosoting Co.

Timber, Treated.
American Creosoting Co.
Central Coal & Coke Co.
Century Wood Preserving Co. (Division of the Wood Preserving Corp.)
Curtin-Howe Corp.
International Creosoting & Construction Co.
National Lumber & Creosoting Co.
Southern Wood Preserving Co.
Wood Conversion Co.

Tires.
Firestone Tire & Rubber Co.
General Tire & Rubber Co.
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Goodrich Rubber Co., B. F.

Tires, Steel.
Edgewater Steel Co.
Midvale Co., The.
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Bethlehem Steel Co.
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Pyle-National Co.

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Industrial Lumber Co.
International Creosoting & Construction Co.

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Union Switch & Signal Co.

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American Bridge Co.
Industrial Brownhoist Corp.
Nichols & Bro., Geo. P.

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General Electric Supply Corp.
Railroad Supply Co.
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Trap Doors.
Edwards Co., O. M.

Trap Doors & Fixtures.
Tuco Products Corp.

Traps, Steam.
Johns-Manville Corp.

Treads, Bridge Floor.
Carnegie Steel Co.

Treads, Safety.
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American Locomotive Co.
American Steel Foundries.
Baldwin Locomotive Works.
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Birdsboro Steel Foundry & Machine Co.
Brill Co., The J. G.
Flexible Truck Co.
Franklin Railway Supply Co., Inc.
Gould Coupler Co.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.
Standard Car Truck Co.
Symington Co., The.

Trucks, Cast Steel Tender.
General Steel Castings Corp.

Trucks, Cast Steel, Electric Car.
General Steel Castings Corp.

Trucks, Cast Steel, Car and Locomotive.
General Steel Castings Corp.

Trucks, Electric Storage Battery.
Elwell-Parker Electric Co.

Trucks, Industrial.
Elwell-Parker Electric Co.

Trucks, Motor.
Dodge Motor Truck Corp.
General Motors Truck Co.
International Harvester Co.
Reo Motor Car Co.
White Co., The.

Trucks, Tender.
Flexible Truck Co.

Trucks, Trailer.
Brill Co., The J. G.
Franklin Railway Supply Co., Inc.

Tubes, Arch.
National Tube Co.

Tubes, Boiler.
Allegheny Steel Co.
Armco Railroad Sales Co.
Bethlehem Steel Co.
Globe Steel Tubes Co.
National Tube Co.
Ryerson & Son, Joseph T.

Tubes, Boiler, Charcoal Iron.
Bethlehem Steel Co.
Reading Iron Co.

Tubes, Staybolt.
Falls Hollow Staybolt Co.

Tubes, Tire.
Firestone Tire & Rubber Co.
Goodyear Tire & Rubber Co.

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Aluminum Co. of America.

Tubing, Seamless Steel.
National Tube Co.

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Vanadium Corp. of America.

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Electric Service Supplies Co.
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Sunbeam Electric Mfg. Co
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American Steel & Wire Co
Ryerson & Son, Joseph T.

Turntable Tractors.
Nichols & Bro., Geo. P.

Turntables.
American Bridge Co.
Industrial Brownhoist Corp.
Nichols & Bro., Geo P.

Typewriter Ribbons.
Remington-Rand Business Service.

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Remington-Rand Business Service.

Uncoupling Device.
Hutchins Car Rfg. Co.

Undercrossings, Corrugated Iron.
Republic Steel Corp.

Underfloor Duct.
General Electric Supply Corp.

Underfloor Duct, Fibre and Metal.
Johns-Manville Corp.

Underframes, Cast Steel, Tender.
General Steel Castings Corp.

Underframes, Cast Steel, Freight Car.
General Steel Castings Corp.

Underframes, Steel.
Bettendorf Co., The.
Brill Co., The J. G.
Pressed Steel Car Co.
St. Louis Car Co.

Underground Conduit.
General Electric Supply Corp.

Upholstery, Car.
Brill Co., The J. G.
Chase & Co., L. C.
Massachusetts Mohair Plush Co.

Valve Caps.
Schrader's Son, Inc., A.

Valve Gears, Locomotive.
Pyle-National Co.

Valves, Air Brake.
Westinghouse Air Brake Co.

Valves, Back Pressure Acetylene.
Oxweld Railroad Service Co., The.

Valves, Balanced Slide.
Hammett, H. G.

Valves, Blow-Off.
Bird-Archer Co., The.

Valves, Check & Angle Steam
Sellers & Co., Inc., Wm.

Valves, Drifting.
Ardco Mfg. Co.
Sellers & Co., Inc., Wm.

Valves, Hydraulic.
Birdsboro Steel Foundry & Machine Co.

Valves, Piston.
Franklin Railway Supply Co., Inc.

Valves, Pop, Safety & Relief
Ashton Valve Co.
Vapor Car Heating Co Inc.
Westinghouse Air Brake Co.

Valves, Pressure Regulating
Gold Car Heating & Lighting Co.

Valves, Throttle.
American Throttle Co., Inc
Bradford Corporation.

Valves, Fire.
Schrader's Son, Inc., A.

Varnish Powder.
Aluminum Co. of America

Varnishes.
General Electric Supply Corp.
Lowe Bros. Co., The
Sherwin-Williams Co.
Vapor Car Heating Co. Inc.
Wine Railway Appliance Co.

Ventilators, Car.
Gold Car Heating & Lighting Co.

Ventilators, Shop & Roundhouse.
Carey Co., Philip, The.
Johns-Manville Corp.

Wardrobes, Rolling and Disappearing Front — (See Lockers).

Washers.
National Malleable & Steel Castings Co.
Ryerson & Son, Joseph T.
Wine Railway Appliance Co.

Washers, Boiler.
Sellers & Co., Inc., Wm.

Waterproofing Materials and Compounds.
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Johns-Manville Corp.
Lehon Co., The.

Water Purifying Materials & Compounds.
Bird-Archer Co., The.
Dearborn Chemical Co.

Water Softening & Purifying
Bird-Archer Co., The.
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Permutit Co., The.

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Tuco Products Corp.

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Franklin Railway Supply Co., Inc.

Wedges, Journal Box.
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Gould Coupler Co.
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Pressed Steel Car Co.
Symington Co., The.

Weed Killer.
Q & C Co., The.

Welding, Electric.
Electric Railweld Service Corp.

Welding Machines, Acetylene.
Oxweld Railroad Service Co., The.
Ryerson & Son, Joseph T.
Westinghouse Elec. & Mfg. Co.

Welding Machines, Electric.
General Electric Co.
Ryerson & Son, Joseph T.

Welding Machines, Flue.
Ryerson & Son, Joseph T.

Welding Materials.
Oxweld Railroad Service Co.
Franklin Railway Supply Co., Inc.

Welding Process.
Oxweld Railroad Service Co.

Welding Rods.
American Steel & Wire Co
General Electric Supply Corp.
Oxweld Railroad Service Co., The.
Ryerson & Son, Joseph T

Welding Supplies.
General Electric Co.
Oxweld Railroad Service Co., The.

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Armco Culvert Mfrs. Assoc
Republic Steel Corp.

Wheel Centers, Driving.
American Locomotive Co.
American Steel Foundries.
Baldwin Locomotive Works The.
Birdsboro Steel Foundry & Machine Co.
Edgewater Steel Co.
Hunt-Spiller Mfg. Corp.
Standard Steel Works Co.
Union Steel Casting Co.

Wheels, Car and Locomotive.
American Locomotive Co.
American Steel Foundries.
Baldwin Locomotive Works, The.
Bethlehem Steel Co.
Carnegie Steel Co.
Edgewater Steel Co.
Griffin Wheel Co.
Illinois Steel Co.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.
Railway Steel Spring Co.
Standard Steel Works Co.

Wheels, Cast Iron, Chilled Tread.
Assn. of Mfrs. of Chilled Car Wheels.
Graybar Electric Co.
Griffin Wheel Co.
Mt. Vernon Car Mfg. Co.
Pressed Steel Car Co.

Wheels, Mine Car.
Carnegie Steel Co.
Edgewater Steel Co.
Griffin Wheel Co.
Mt. Vernon Car Mfg. Co.
Standard Steel Works Co.

Wheels, Passenger Car.
Carnegie Steel Co.
Illinois Steel Co.
Edgewater Steel Co.
Griffin Wheel Co.
Pullman Car & Mfg. Corp.
Standard Steel Works Co.

Wheels, Steel and Steel Tired.
American Locomotive Co.
American Steel Foundries.
Carnegie Steel Co.
Edgewater Steel Co.
Illinois Steel Co.
Lima Locomotive Works.
Railway Steel Spring Co.
Standard Steel Works Co.

Wheels, Wrought Steel.
Armco Railroad Sales Co.
Bethlehem Steel Co.
Carnegie Steel Co.
Edgewater Steel Co.
Standard Steel Works Co.

Whistles.
Ashton Valve Co.

Whistles, Locomotive.
General Electric Co.
Westinghouse Air Brake Co.

Window Fixtures.
Edwards Co., O. M.
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Wire.
American Steel & Wire Co.
Kerite Insulated Wire & Cable Co.

Wire, Fence.
American Steel & Wire Co.

Wire, Insulated.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
General Electric Co.
Graybar Electric Co.
Kerite Insulated Wire & Cable Co.

Wire, Rail Bond.
American Steel & Wire Co.
Graybar Electric Co.

Wire Rope Clips.
American Steel & Wire Co.

Wire Rope.
American Steel & Wire Co.

Wire, Telephone & Telegraph
American Steel & Wire Co.
Anaconda Wire & Cable Co.
Graybar Electric Co.

Wire, Welding.
American Steel & Wire Co.
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Century Wood Preserving Co. (Division of the Wood Preserving Corp.)
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National Lumber & Creosoting Co.

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Wood, Preservative Treatment (Zinc Meta Arsenite).
Century Wood Preserving Co. (Division of the Wood Preserving Corp.)
National Lumber & Creosoting Co.

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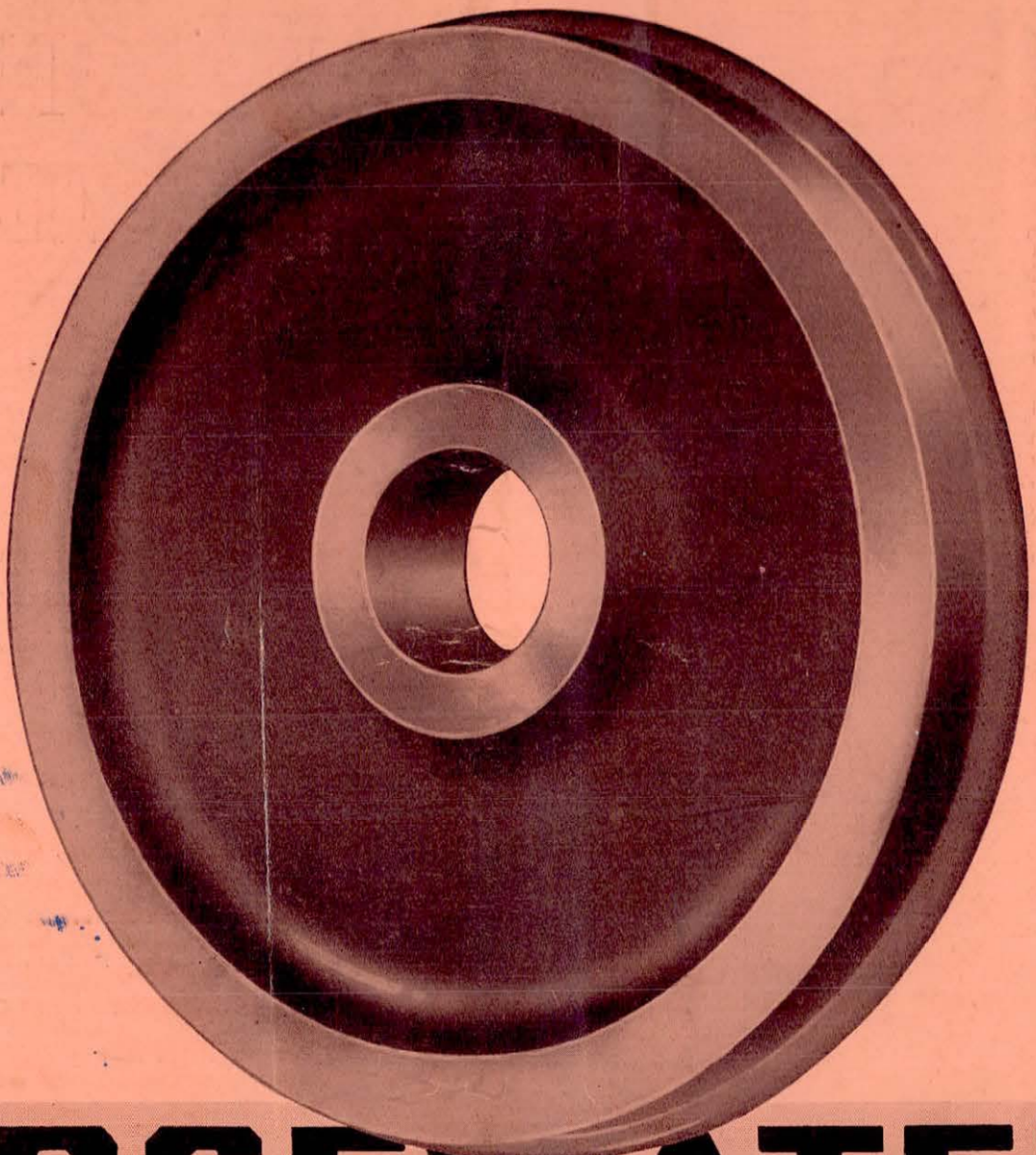

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